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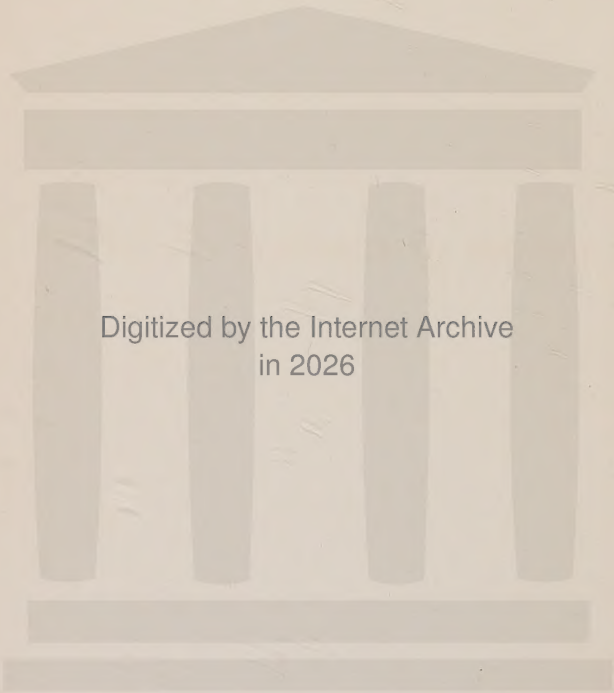

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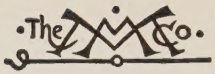
THE HISTORY OF EUROPEAN PHILOSOPHY



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THE HISTORY

OF

EUROPEAN PHILOSOPHY

AN INTRODUCTORY BOOK

BY

WALTER T. MARVIN

New York

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To
HOWARD CROSBY WARREN

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PREFACE

The purpose I have had in mind to fulfill in writing this book has been solely pedagogical. I have not endeavored to add anything whatever to our knowledge of the history of philosophy, and if by chance I have anywhere offered new points of view, this has been quite subordinate to my main purpose. On the contrary, I have in several chapters deliberately depended upon one selected secondary source and in a few chapters I have ventured even to quote my secondary authority at length. (I have indicated this indebtedness wherever I have thought it of any importance to the reader to do so.)

Two pedagogical considerations have determined the character of the book. First, my experience is, that the traditional and conventional text-book on the history of philosophy, however excellent and scholarly, is not well adapted to the needs of undergraduate students. Such a book is an epitome of the doctrines of the great philosophical thinkers, and is both unintelligible to the beginner and too detailed to be learned and remembered by him. It attempts to make the student acquainted with the difficult and detailed doctrines and reasonings of the philosophers when only a long and careful study of their writings can really bring this about. Moreover, it fails by not relating the information it gives to the other historical information prerequisite to the study of the history of philosophy, and thus it forms, if learned, a sort of logic-tight compartment with no openings into the fields of psychology and anthropology, of general political, social and economic history, and of the history of literature,

art, and general culture. It ignores the fact that the philosophy of any period or age is the outcome of the total civilization and of the changing civilization of the time. Hence to avoid these errors, I have tried to confine my book to major philosophical movements and to approach the study of any philosophical movement from the general history of the era, and I have tried to indicate the relations between the philosophy of the age and the other great spiritual and social changes that were taking place. Second, a beginner's text-book on the history of philosophy, in my opinion, should include as few details as possible, should leave much to be taught directly by the instructor in charge of the course, and should presuppose that the student is to do a large amount of outside reading. To make this reading possible the text-book must be brief and concise, and must resemble in its character a syllabus. However, it may properly include more topics than the student will have time to study at length, so that the instructor may select from the list the topics most suitable to the needs and interests of the individual student.

The readings I have suggested are merely suggestions, though serious ones. They are not bibliographies.

WALTER T. MARVIN.

Rutgers College,
March 24th, 1917.

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PART I

INTRODUCTORY

THE HISTORY OF EUROPEAN PHILOSOPHY

CHAPTER I

THE RECENCY OF CIVILIZATION

1. The relative recency of civilization.—Man has not always been the man we now behold. Man sprang from a brute ancestry and took many tens of thousands of years to reach the level of civilization found at the beginning of what we usually call history, that is, the level attained four thousand years before Christ in the lands bordering upon the Mediterranean Sea. Even the beginnings of Egyptian, Sumerian and Babylonian civilization seem but of yesterday, if their recency is compared with the remoteness of the time when man first used the rudest stone tools. Moreover, from the dawn of history to our own day, during this period of less than ten thousand years, parts of the human race have developed not only relatively but also absolutely to a far greater extent than man developed during the preceding one hundred thousand years. The three familiar and wonderful examples of this rapidly developing civilization in the western world have been the three thousand years of ancient Egypt and Mesopotamia preceding the Christian era, the twelve hundred years of Greco-Roman history from 800 B. C. to 400 A. D. and the seven hundred years of modern Europe from the beginning of the thirteenth century to the present time.

For further study read:

Robinson, J. H., The New History, 1911, 236–266;
Marett, R. R., Anthropology (Home University Library);
Clodd, E., The Story of Primitive Man, 1910;
Ratzel, The History of Mankind, 1896, Book I.

For more extensive study read:

Osborn, H. F., Men of the Old Stone Age, 1915;
Sollas, Ancient Hunters and their Modern Representatives, 1915;
Buttel-Reepen, Man and his Forerunners, 1913;
Keith, A., Antiquity of Man, 1915;
Meyer, E., Geschichte des Altertums, 3te. Aufl., 1910, Bd. I, Erste Hälfte;
MacCurdy, G. G., Recent Discoveries Bearing on the Antiquity of Man, 1910 (from Smithsonian Report of 1909);
Haddon, A. C., History of Anthropology, 1910.

2. The causes of the rise and growth of civilization: (a) The further evolution of man's brain.—Psychology limits the possible causes at work in evolving civilization to two distinct types. First, man's inborn mental nature, the nervous system given him by heredity, may have been improving. Second, man's environment, that is, the sum total of the factors acting upon this inborn nature, may have become more and more favorable to further civilization. If the first cause has been present, man's progress can be explained in the same way as can man's superiority to the brute. That is to say, we can argue that precisely as the brain of prehistoric man had evolved to a higher type than that possessed by his prehuman ancestor; so man's brain has continued to evolve to a higher and higher type, with the result that the European has a better brain to-day than had the European six thousand years ago. To repeat, if such an evolution has indeed taken place, it would explain man's recent progress in civilization; for it would give the modern a superior intellect, or capacity

for civilization, to that of prehistoric man, precisely as the earlier neural evolution gave to prehistoric man an intellect superior to that of the beasts whom he hunted, not by his greater strength or speed, but by his manual dexterity, his weapons and his strategy. However, we may not accept this possible cause; for all the evidence that we as yet have from historian, anthropologist, and psychologist, indicates no important advance in the inborn structure of the human brain during the past six thousand years, and certainly no advance comparable to that which must have taken place in our race's evolution remote ages ago. Perhaps the most that can be maintained in favor of the belief that man's inborn nature has improved, is that natural selection may have tended to weed out the feebler intellects, may have favored the better intellects, and thereby may have raised slightly not the best but the average intellect.

(b) **The influence of the environment.**—Be this as it may, the second possible cause, namely, the environment, has been by far the more potent factor; for the evidence we have, indicates that environment has been not only an indispensable but also a sufficient cause of human progress. Expressed in briefest and baldest form, *the invention of tools and of arts has increased the food supply, this has increased the population, and the last has increased socialization and civilization.* Once in existence, a little civilization can by the same process beget further civilization and an increased civilization can beget a higher and higher civilization at a rate comparable to a geometrical progression. A stimulating and favorable climate, a good geographical habitat, natural wealth in food, in wood, and in minerals, more efficient instruments for tillage, for transportation, for building, and for the various industries, a denser population, an increased socialization, a more efficient language, a wider acquaintance with other lands,

their people, and their customs, a nobler architecture and nobler plastic arts, a richer industrial, biographical, social, and artistic tradition, and a written lore, have each and all been either contributing or indispensable causes for the continued growth of civilization. Many of them have been stimuli that excite curiosity, that suggest problems, and that arouse novel thoughts and other new ways of reacting. Moreover, such a growth in civilization provides more and more the indispensable tolerance and reward for inventiveness, for analytical thought, and for critical reflection. Soon it provides also as stimuli the deeds and thoughts of great men, stimuli which excite younger men to study, to imitate, and to criticise the arts, the customs, and the doctrines of their elders. Thus the very enterprise of progress becomes itself a tradition and a profession. Finally, from the very beginning, civilization tends to become an international possession and nations tend to contribute mutually to further progress; for in the early stages of civilization as well as in the later, beliefs and customs tend to spread, carried by the trader, the traveller, and the warrior.

However, a word of caution must be added to this story of the influence of environment upon civilization. Civilization does not always beget higher civilization. Civilization can remain stationary, it can decline back even into savagedom. Civilized environments are exceeding complex and are never alike in different times and in different places; and unfortunately some of the greatest or most rapid advances in civilization seem to have been dependent upon some quite exceptional combination of environmental factors, since often in man's history these most rapid advances have persisted for but relatively short periods.

(c) **The influence of the exceptional man.**—The presence of a subordinate psychological factor indispensable to the growth of civilization should be noted in addition

to the two ultimate factors, change in inborn nature and environment. This factor is the man of exceptionally high ability. Could we see the thousands and thousands of inventions and novel thoughts and deeds *actually in the making*, the thousands of individual acts that have been the most important events in history, whom should we see to have been their true authors? From what we know regarding some of these events which the historian has been able to examine in detail, and from what is psychologically most probable, we can infer that the true authors were in most instances men above the average ability of their horde, tribe, or nation. To guess what the history of Europe would have been, had this or that man of genius not been born, may be utterly idle; but it is not venturesome to assert that our civilization would never have arisen, had some superhuman agent destroyed in each generation all the children whose inborn mental nature ranked among the highest ten per cent in excellence. If this is true, then the following propositions are of great importance in the study of history. First, the denser the population the greater will be the absolute number of these exceptional children and the higher will be the probability that among them are some children of quite extraordinary ability. In other words, though the average inborn mental nature may not have improved in the course of the past six thousand years, the inborn nature can be said to have improved absolutely wherever population has greatly increased in number. And such an increase is typical of advancing civilization. Second, psychology shows that environment brings about far greater and far more desirable changes in the mental nature of the exceptionally capable child than in that of his mediocre companion. That is, he is more easily civilized. Third, the exceptionally capable men are as a type far more masterful and inventive than the mediocre, and therefore they are to a greater degree

makers of their environment, to a less degree dependent upon favorable environment, and in general they are the probable human authors of progress.[1]

(d) **The causes of the slowness of progress in primitive civilization.**—Such being the causes of the growth of civilization, why were the earliest stages of primitive culture so very long? This problem is for the most part psychological and, if so studied, is easily solved. The first tools must have been the objects that untutored man would pick up and use instinctively, such as sticks and stones. However, that a stone could be fastened to a stick, was as far beyond this wild man's dreams as was the electric locomotive; and of course that a stone could be chipped or polished into useful shapes never entered his thoughts. Such habits must have had several stages and each of these stages doubtless had to wait for some happy accident to occur among man's animal-like and quite unreflective experiments. Indeed, to expect them to occur as reflective inventions rather than as lucky accidents would be as absurd as to expect the baby to begin his mathematical thinking with the notions of the calculus. We should recall that it is quite impossible for us to imagine or to think about objects that lie altogether beyond our experience, for example, for an infant to think about bacteria or for a savage to invent an automobile. Thinking always presupposes knowledge. Therefore the beginnings of culture had to be unreflective or quite accidental. Moreover, if this conclusion is probable of such simple habits as fastening a stone to a stick, how much the

[1] I say "human authors of progress," for we must not forget that even the most gifted of men but shares in this authorship with his environment. Without a favorable environment to stimulate him he would not invent or progress and without such an environment to reward and to foster his enterprises they would die in their very beginnings.

more should we expect that only the happiest and most infrequent of accidents could have led to the discovery of such processes as the making of fire, the tilling of the soil, the making of pottery, and the working of copper and iron!

3. The primitive beliefs and customs the source of the later civilization.—Precisely as man's body has evolved out of the body of his anthropoid ancestor and precisely as human instincts have grown out of the instincts of the early primates; so also has the civilization that we study in history evolved from the primitive customs of prehistory. Moreover, there follows the important corollary: a people's culture, as found by the historian, cannot be understood by him until he discovers the primitive beliefs and customs from which that culture evolved. Nowadays this principle seems to us almost a truism; for with our evolutionary habits of thought we cannot see how history can be studied otherwise.

During the period of recorded history the fact of evolution is evident. Civil law and political institutions, industrial, commercial and banking customs, methods of transportation and numberless machines have evolved by stages that are known in detail; and some of these stages have been gone through almost before our very eyes. And if the new has grown out of the old when progress has been so largely the result of reflective thought, how surely must it have so grown in the early days of history! The evidence that it did so is abundant. The anthropologists and the students of the dawn of history are revealing to us everywhere the growth of early civilization out of primitive culture, for example, in the political and social organization of peoples, in their religion and speculations, in their buildings, and in their tools and industries. Even such sciences as medicine, chemistry, astronomy, and history grew directly from primitive magic and myths.

Let us consider a few familiar instances. The Greek

tragedy grew out of religious ritual and songs and retained even in the days of its greatest glory its thoroughly religious character. The epic is evidently the outgrowth of the songs or ballads chanted or recited by the bards. In the ancient religions of the Mediterranean world the sacrifices and the sacraments grew directly from the savage practices of totemism or similar customs. The fast and other holy days are the offspring of earlier savage tabooes. The prayers are later stages of the magic words by which the seer compelled the totem or other power to obey him; and some gods at least are the descendants of totems worshipped by earlier generations. The domestication of animals probably goes back to the customs of caring for the totem or sacred animal. The beginnings of the study of the stars and of theories that we may call the first astronomy grew out of early magic and related religious customs of which astrology is another descendant. The beginnings of what may be rightly called medical science developed out of the practices of the magician or medicine man; and modern chemistry is the offspring of medieval alchemy. The ancestry of Roman and English civil law is to be found in the customs of these peoples in earlier generations. Finally, the political and social organization of ancient Rome or of any other great nation, ancient or modern, goes back to the tribal customs of their ancestors; and those differences between nations in their political and social organization which even revolutions and centuries of intercourse cannot eradicate often go back to ancestral customs older than the nation itself. The solidly practical and efficient management of the Roman government as compared with that of the typical Greek governments is an example of such a difference. "We can see this peculiar gift showing itself at all stages of their (Roman) development: in the agricultural family which was the germ of all their later growth, in the city-state which

grew from that germ, and in the Empire, founded by the leaders of the city-state, and organized by Augustus and his successors." [1]

4. The survival of the primitive within civilization.— A remarkable fact in the evolution of civilization, as in all other evolution, is that the old persists often along with the new. As man's skeleton remains to a large extent the skeleton of his quadrupedal ancestors; so also do tools, customs, laws, institutions, and beliefs retain countless vestiges of the older or even savage beginnings from which they evolved. For example, the marriage ring, the rice thrown at the departing bride, the gargoyles on Gothic churches, the shaking of hands are vestiges of the customs of an immemorial past. The common law retains numerous elements going back to the customs of barbaric ancestors and the treatment of the criminal remains still partly barbaric. Church and college are especially rich in vestiges of great antiquity. Among our beliefs, even in the most cultured circles, remain to this day many stupid fears or superstitions. Finally in science as well vestiges of savage beliefs are not difficult to find. Psychology and biology still retain many remnants of the animism, or demon theory of primitive peoples. For many the mind and its faculties are a sort of jack-in-the-box that does things and needs not itself to be explained. A similar vestige of the day when nature was thought of as full of demons, spooks, and other living agents is to be found in the notion, "force," as entertained by physicists in recent centuries.

However, the most extensive survival of primitive beliefs and customs is to be found in what we may call the humbler strata of civilized societies. Precisely, as some areas of the earth's surface reveal in the geological strata that compose them deposits not only of many periods but

[1] Fowler, Rome, p. 14.

also of periods of remote geological ages; so civilized society reveals in the groups of people that compose it, from the most ignorant to the most cultured, the survival of different levels of civilization. In lands that are least progressive, in remote and lonely districts, among the lowest peasantry, fisher folk and sailors and in the slums of our great cities we are likely to find prevalent many beliefs and customs of the distant past. Here the religion, the superstitions, the medical practice, and the beliefs regarding the growth of plants and animals, regarding life and mind, and regarding the processes of nature about us and above us are often not only as crude as that of barbarians but also as ancient.

If all of this is true, the student of history is to seek and to expect to find everywhere within the beliefs and customs which make up the culture of any land or age, older and even primitive beliefs and customs, which have come from the ancestral culture of that land or age. For example, the religion of the golden age of Greece, as students of Greek religion are to-day pointing out, contains numerous vestiges of the savage religion of a vastly older culture. And what is true of the religion of Greece is true of all ancient religions. And what is true of these religions is in a greater or less degree true of everything else in ancient and modern history. Thus you and I still speak habitually of the sun rising and setting, and during nine hundred and ninety-nine moments out of a thousand the earth beneath us is unreflectively regarded as the motionless bottom of the universe. In other words, the culture of any age or land is not one thing, rather it is a multitude or vast collection of habits, among which some may be new but others are older and some may be even prehistoric. As the culture changes only part of the collection of habits is altered. That is, new habits are added and only some of the older habits die out in competition with the new ones; whereas

others that do not compete at all or only feebly, survive.

5. Conclusion.—This recency of rapidly developing civilization compared with the length of man's prehistoric period and these truths regarding the origin and growth of civilization are most significant. On the one hand, they suggest that civilization may still be but an infant and therefore that man may yet be far from the best solution of life's problems. On the other hand, they show with what exceeding difficulty man discovered the first tools and methods for subduing nature and outgrew the customs and beliefs that in each generation he acquired from the social group to which he belonged. Indeed, the fact that change and progress have been so difficult suggests that the greatest dangers and obstacles to progress man faces in all ages are conservatism rather than radicalism, inertia rather than perseverance, group restraint rather than individual initiative, and the ready acceptance of the old and customary rather than investigation and invention.

For further study read:

Boas, F., The Mind of Primitive Man, 1911, Chaps. I–IV;
Thorndike, E. L., Educational Psychology, 1913, Vol. III, Chap. X;
Ratzel, The History of Mankind, Book I.

For more extensive study read:

Thomas, W. I., Source Book for Social Origins, 1909.

CHAPTER II

THE HISTORY OF PHILOSOPHY

1. The history of the growth of knowledge.—As stated in the preceding chapter, a civilization, or culture, is an exceeding complex group of more or less closely interconnected social habits, or customs, within which group are an indefinite number of minor, or subordinate, groups. Corresponding to these minor groups the study of the history of any great civilization can be divided into an indefinite number of possible subdivisions. For example, the study of the history of Roman civilization includes within it the study of the history of many minor groups of customs such as that of the Roman law or the Roman military art, and finally the study of the history of individual customs such as that of the Roman triumphal arch or that of the Roman *imperium*.

Within the history of western civilization we are to study in this book one such subordinate group of customs, that is, we are to study the history of those habits, or customs which we call European intellectual life. From the preceding chapter there follow at once regarding this subject of study, the intellectual life of Europe, that it has evolved and that in it are to be found all the major characteristics of evolving civilization. During the thousands of years of European history, our insight, our beliefs and our other habits of thought have undergone vast changes corresponding usually to the vast changes in our civilization. Each later stage of intellectual life has evolved out of the preceding stage of culture, and

in each later period many of the intellectual habits of earlier periods have survived. Hence, precisely as our European civilization evolved out of the primitive culture of prehistory, so also did our European intellectual life and in particular our science; and, precisely as we Europeans have ever remained primitive in some of our customs, so have we remained primitive in some of our beliefs and other habits of thought; and lastly, precisely as different strata of our population exhibit customs of unlike antiquity, so do these strata exhibit also beliefs and manners of thought of unequally remote origin. Let me illustrate each of these points: The wonderful development of Greek thought during the height of Greek civilization and the marvellous progress of the various sciences in western Europe during the past three hundred years are evidently instances of vast evolution in intellectual life. The history of English civil law is an instance of later intellectual habits evolving out of the customs of earlier periods and also of the tenacity with which some intellectual customs can survive for ages. The widespread belief among cultured peoples in man's immortality is one instance of the survival of an extremely ancient belief, and so is also the belief that one can do acts of kindness for the dead. Finally, the widespread belief in ghosts, magic, clairvoyance, and magical cures among the ignorant and isolated strata of European and American peoples and the absence of this belief among the highly cultured strata of these peoples illustrate the fact that different strata exhibit beliefs of unlike antiquity.[1]

[1] To this brief introductory statement of our subject of study, the growth of European intellectual life, should be appended the important truth that a man's intellect is not one thing but a group of thousands upon thousands of elementary and largely independent habits, none the less independent though often variously organized

2. The meaning of the term, philosophy.—Interesting as is the entire story of the growth of European thought, we must confine our study to one part of that story, the history of European philosophical thought. What is philosophy, or philosophical thought? In the first place, philosophy is *an aspect of all belief or thought* from that of a savage or child to that of a Sir Isaac Newton. Hence each normal human being is a philosopher and therefore philosophy is something out of doors and not merely something in libraries and in the minds of extraordinary men. You, the reader, have a philosophy as truly as you

into complex habits. As a result, some of a man's beliefs can be primitive and others modern, and some of his beliefs can change radically while others remain fixed. He can be even the greatest living scientist and yet a savage in some of his convictions. In short, the intellect even of the modern cultured man is like an historical museum; for it contains relics of every age in his line of intellectual descent, all resting quietly side by side in their cases, the neural arches of his nervous system. Though logically some of these exhibits (*i. e.*, habits) are in utter conflict, psychologically they often remain peacefully side by side where training has placed them. Moreover, when one is added or one is taken away from the collection the others or the vast majority of the others can remain undisturbed. Here as in other matters what is true of the individual is often true also of the social group, for the social intellect too changes by mere addition and subtraction as well as by reorganization and disorganization of customary beliefs. For example, though all our elementary schools for generations have taught us that the earth revolves on its axis daily, and that the earth and other planets move in orbits about the sun, still many continue to locate God *up* in heaven. Though a large percentage of men in cultured lands have been taught to regard medicine as a science and a technical art, still it is necessary for the physician "to inspire confidence in us" by his *appearance* and *manner*. To this extent he is still a "medicine man." Though most of the events in nature are explained by us as naturalistic and deterministic, the acts of man's will are still for the most of us supernatural and indeterminate. Though we are well aware that kings are ordinary mortals, even the king of democratic England is still a sacred person. Though our morals have become in part strictly utilitarian, how many trivial sins remain heinous!

have a coat or a knife; and this philosophy of yours has a long history reaching back into the days before civilization began as truly as have your clothing and your tools a story reaching back before the days when men began to work metals and to weave baskets and cloth. In the second place, as all beliefs and thoughts are usually social habits, so also is philosophy a social habit. Precisely as we speak of an eighteenth century custom of dress, so also may we speak of eighteenth century philosophical thought; and precisely as we use the expression, English law, so also may we use the expression, English philosophy. In short, philosophy is the name of certain customs; and every normal man, civilized or savage, possesses one or another of these groups of habits and for the greater part he possesses them in common with his people, class or set.

But what marks such a habit, that is, such a belief or manner of thought as philosophical? To answer this question either definitely or clearly is difficult. A philosophical belief or manner of thought differs from any other by being *logically general* and the more general it is the more genuinely philosophical is the habit. Again a belief is philosophical provided it is *logically fundamental* in a man's thinking. For example, the present widespread belief that every event has a cause and that this cause is always of such a character that it can be discovered and verified by employing the methods of scientific research, is a philosophical habit of thought, a habit actually controlling the behavior of men in founding the research laboratories of the many types which now exist. This habit of scientifically investigating everything that is of any interest or importance to mankind is relatively new in the history of civilization. It did not exist in the middle ages and has since come only step by step. One name for it is naturalism. Now naturalism is a highly general doctrine, for it is applied to almost everything intellectual

in which cultured men are interested. Moreover, it is logically fundamental; that is to say, if it is not true thousands of beliefs which we regard as virtually certain are false. It is therefore philosophical.

The definition of philosophy is so important that it justifies the mentioning of several other examples of philosophical custom. The change in the astronomical belief during the sixteenth century from the geocentric to the heliocentric hypothesis was philosophical; for the older belief was logically indispensable to the general conception of the universe entertained throughout the middle ages and the ancient world. The rise of the belief, usually called the conservation of energy, was an important event in the history of philosophic thought because this doctrine is fundamental to all natural sciences and their application. Again, those principles underlying the French revolution, called the Rights of Man, may properly be called philosophical; so also may the religious belief in a universal divine providence. In artistic criticism the difference between those who emphasize structure or form and those who minimize this, emphasizing on the contrary color or content may properly be called philosophical. Indeed, I see no reason why such a difference in art as that between the Greek and the Gothic should not also be called philosophical. In short, whatever is highly general or logically fundamental or nearly fundamental in man's thoughts, in any period or in any land, is philosophical, however indefinite the limits between such thought and that which we do not call philosophical must remain.

3. Philosophical growth and its causes.—The student of the evolution of civilization will expect to find exemplified in the history of philosophical thought the same general features of evolution that we have already outlined. To him it is a matter of course that modern philosophical thought has developed from the intellectual life

of earlier times and ultimately from primitive belief and thought; also that much of the ancient and even primitive has survived, especially among the isolated peoples and the ignorant classes. Indeed, he would expect to find that the inertia of philosophical thought is especially great; because such thought is logically general and fundamental, and many customs have to change before a philosophical growth has been completed. Therefore any marked change in philosophical thought deserves the name revolution. For example, it has taken centuries of the bitterest struggle against individual and group inertia to change the philosophical thought of medieval Europe into that of Europe of the twentieth century; and the process has by no means even yet reached an equilibrium, as the continued growth of democracy and of naturalism bears witness.

We may now ask the most important question a student of the history of philosophy can raise: What causes philosophical change and who discovers or invents the new philosophy? Evidently, it follows from what has been said in this book thus far that there are few places where the individual man is less able to change himself and his fellows than in their philosophy. Then too, philosophy is pre-eminently a group phenomenon, and groups are usually inert. Indeed, few changes in civilization are the work of only one man even though the part some one man has played is indispensable; and how much fewer must such changes be when they are revolutionary group changes! Hence we may regard the causes which bring about marked philosophical growth among a people or class as many, widespread and various. In the first place, every cause that affects the general civilization, be the cause political, social, economic, industrial, religious or intellectual can lead to profound changes in at least some of the intellectual habits either of the community or of some

classes within the community. Thus the multitudinous causes that brought into existence modern Europe were also the causes that in great part transformed Europe intellectually. Such were the growth of cities with their industry, wealth and trade, the widening of the geographical horizon to include the entire earth, the increasing political solidarity and centralization of government and the decay of feudalism. In the second place, great practical inventions and great scientific discoveries can lead to profound changes in philosophy. To discover ways and means to make the supply of food surer, to conquer disease, and in general to increase the power of man over his fortune is to change his attitude toward the world about and above him; for to do so is to remove the mystery, uncertainty and magic which seem to primitive peoples to surround them and to hold them in arbitrary and irresistible control. Likewise, to discover important facts and to explain familiar facts in new ways are preeminently to cause philosophical change. The astronomical, physical and biological discoveries made during the past four hundred years have revolutionized our conception of nature and of man's place in nature. Verily we live intellectually in a different universe from that in which our fathers lived five centuries ago!

If such are the causes of philosophical growth, who are the great philosophical discoverers? Evidently, the great leaders in every walk of life during such periods of progress and especially the great scientific discoverers and the great thinkers. Of the latter class such men as Galilei, Harvey, Newton, Lyell and Darwin literally disclosed to the eyes of modern Europe a hidden universe. So did the great classical scholars and artists of the Italian Renascence. So did the great jurists. So did the great political leaders of the modern democratic movements. So did the great explorers of the fifteenth century. And so did the great

inventors of modern machinery, of modern medicine, and of modern commerce and banking. But in particular it is true that the discoverers of important facts and the men who first succeed in rightly explaining facts are pre-eminently the men that deserve to be called the authors of philosophy.

4. The program of this book.—Having now surveyed the field which forms the subject-matter of our study we can very briefly outline the program of this book. The general subject being the history of Western philosophic thought, we shall give a very brief account of the changes in man's mental nature wrought by civilization and of the primitive thought out of which Western thought has developed, and then we shall trace the development of philosophic thought within civilization from the thought of the Greeks to that of modern Western Europe and the countries most closely allied to Europe in culture. The subject of the next chapter will be the changes wrought in man's mental nature by civilization.

For more extensive study read:

Sidgwick, H., Philosophy, Its Scope and Relations, 1902.

CHAPTER III

CHANGES IN MAN'S MENTAL NATURE WROUGHT BY CIVILIZATION

1. Introductory.—We have now answered in most general terms the question: What are the factors which create civilization and science? Let us next endeavor to answer a second and related question: In what general or typical respects does the highly civilized and intellectual man *differ mentally* from the savage, the barbarian, and the uncultured?[1] What general and typical changes take place in man's learned, or acquired mental nature as he becomes more and more civilized?[2] These changes in man's acquired mental nature can all be roughly suggested by saying that the savage stands between the highest brutes and the highest men, or that he is mentally more brutal than is the civilized. Hence, in the chief respects in which human mental nature differs from that of the highest brutes, we shall find the answer to our question. These differences are at least six in number. (*a*) Man differs from the brute in his capacities to learn. (*b*) He differs from the brute in being instinctively more curious and in his playful love of thinking for its own sake. (*c*) He differs from the brute in his capacity to learn to react to the elementary and abstract features and relations

[1] As we have seen, there is little reason to believe that we differ in *inborn nature* from our barbaric ancestors of four thousand years ago. Hence throughout this chapter we are dealing only with man's *learned*, or *acquired* mental nature.

[2] Evidently this question is directed to the historian and to the psychologist in common.

of the total situations to which he has been responding. (*d*) He is less crudely emotional than is the brute. (*e*) He is to a less extent the creature of the moment, that is, he is less suggestible. (*f*) He is more social, that is, he is more interested in the behavior of his fellows and his responses are more liable to be controlled by their behavior and welfare.

2. Learning by imitation.—That brutes ever learn from perceiving the conduct of other members of their species is highly doubtful. It is certain that the child does so frequently. For example, we can *show* the child or the man how to ring a bell, lift a latch, open a box; whereas it is doubtful that the monkey for whom among brutes such tricks are easiest can learn them by *imitation*. Though a monkey, an elephant, or a dog may learn such tricks easily, he does so by what is called the trial and chance success (or trial and error) method, that is, by hitting upon the trick the first few times quite accidentally and, if rewarded, by doing it again and again until the habit is well established. Finally, man can learn *rationally*, or through *thinking out* the way and means or by having the way and means *explained* to him. This we have every reason to believe is quite beyond the brute.[1]

Though the savage child has the inborn capacities to acquire these higher ways of learning, his environment

[1] Both of these human methods, it is true, presuppose considerable education of the trial and success sort in infancy and childhood, and can probably be reduced to this method of learning. The child that can open a box by imitation has already learned by the primitive method to manipulate many similar things and is strictly speaking not imitating but using habits already formed. In short, the higher methods, imitation and reasoning have grown out of the trial and success method by continuous stages. But even so, the child's docility is, to an extraordinary extent, superior to that of the most intelligent brute precisely in *this marked capacity to acquire higher methods of learning.*

does not educate him in these traits to any such extent as civilized environment with its work-shops and schools educates the child of modern Europe. Further, a similar truth holds of the successive stages through which civilized man has risen from prehistoric barbarism and ultimately from savagedom. In other words, *the lower down we go in civilization the cruder become the ways in which learning takes place.* At one extreme stands the crude trial and success method of the brute and at the other extreme the methods and technique of modern scientific research, exposition, and demonstration.

3. The broadening of curiosity.—The second human trait, man's instinctive curiosity, is known to everyone familiar with young children. The eagerness with which they watch moving objects and persons about them, inspect objects, and manipulate everything upon which they can lay hands, and also the ceaseless questioning of the older child, illustrate this manifold curiosity. Here too environment has made a great difference in the traits resulting from the same inborn nature. In the civilized environment are innumerable and ever-varying objects that attract the child's attention, and ever-present encouragement to attend and reward for attending. Later, the school and, later still, the professional environment lead him to acquire interests far removed from his original tendencies to be curious. The result is that the highly cultured modern has a wealth of interests in problems, in things, and in events, to which the savage is as blind as are man's domestic animals.

In this mental characteristic also the history of civilization reveals the gradual ascent from the traits of the savage to the traits of the highly intellectual and cultured modern. Little by little the civilized man has acquired new and additional interests until his interests have become numberless and world-wide, until the world to which

he responds is infinitely more complex than is the world of his savage ancestor.

4. Increase of the ability to analyze.—The third trait, man's ability to analyze, is pre-eminently human; indeed even the average man, not to mention the very stupid man, is narrowly limited in the extent to which he can become interested in the abstract and general and respond to them successfully. The brutes seem able to react only to total situations and sensible qualities, and never to the abstract or general aspects of these situations, to their elements, or especially to the relations holding between these elements. In contrast to the brute and the imbecile, the average child learns, and learns easily, to react to the shape of an object, to its squareness, its roundness, or its triangularity. He learns to react to the length and the breadth of objects, to their number, their age, their ownership, their value, and to many other general or abstract properties. However, as we raise the degree of generality and abstractness, mental tests show that we are passing beyond the intelligence of the average child; and finally when we test men's ability to apprehend such relations as are studied in advanced courses in logic, mathematics and other sciences, we find that we are passing beyond the intelligence of all men but the exceptionally intellectual. From all of this we can infer that to the ability of the brute to react to total situations and to the sensible qualities of things, man has in the course of his evolution from the brute acquired the further capacity of splitting up these total situations into their elements and of reacting to these elements and especially to their relations. Indeed, precisely this capacity is what we mean by the word, *intellect.*

In turn, civilized environment has proved to be a powerful agent for developing these higher capacities of man, when they exist in the child, into the intellectual habits

of the adult; whereas the savage environment has not so proved, for it keeps man blind to those abstract elements, those general aspects, and those hidden relations of things which to the modern European seem unavoidably noticeable. And the history of civilization here too repeats its story of man's advance by stages from savagedom. To discover the general and abstract and to notice the obscure relations between entities have been slow and difficult tasks. A few steps have sometimes required even centuries. However, little by little under the leadership of men of genius, highly cultured mankind has come in time to respond to the multitudinous entities studied in the abstract and general sciences of our modern world.

5. Man becomes less crudely emotional.—Psychologists tell us that the cruder emotions are made up of gross and blind responses and that their peculiar field of sensory experience is one where analysis and knowledge have never made much progress. In other words, the cruder emotions are especially symptoms of a lack of definite learned ways of reacting to the given situation. To illustrate these points: Compare the utter blindness of an experience made up solely of such sensations as those of hunger, satiety, pain, comfort, and drowsiness, with the information we owe to our external senses, especially to our eyes, ears, and cutaneous and kinesthetic sense organs. Again, compare the reactions of a panic-stricken man or child, for example, a child being stung by a wasp, with the thrusts and parries of two expert contestants in a fencing duel. As man has evolved from the brute and in turn from the savage, a tendency has arisen to eliminate the crude emotions of the brute and of the child and to substitute for them less crude emotional responses and especially skillful responses. That is to say, the tendency has developed to eliminate the blind and crude reactions of anger, joy, fear, and similar types of response, and to acquire in their place the defi-

nite and precise reactions of the thoughtful, the learned and the skillful.

Though this transformation is never complete even in the most cultured; the man or woman remaining crudely emotional in highly civilized communities is regarded as either sick or mentally deficient, as insane or criminal, as superstitious or grossly undisciplined. Where cultured man has remained emotional there has often arisen in the place of the savage emotions critical insights and types of feeling which may be called in the broadest sense of the word esthetic. Good taste tends to restrain and to select wherever and whenever emotions arise; and crude appetites, crude enjoyments, crude fears, crude griefs, and crude ragings tend to be condemned and inhibited.

6. Man becomes less crudely suggestible.—Another prominent difference between the mind of the brute and that of man and between the mind of the savage and that of the civilized is the decreasing suggestibility of the higher mind. The child and the savage are markedly creatures *of the sensations of the moment.* Restrained impulses, long sustained work, consistent plans, consideration of tomorrow's welfare, careful scrutiny of beliefs are seldom among their virtues. Only the highly trained and disciplined mind can consider and keep considering the welfare of a lifetime and of future generations, or the many elements that enter into most problems and their solutions. Suggestibility is then merely a name for the absence of such restraint in thought and other types of behavior.[1] To illustrate: At one extreme (suggestibility) we might

[1] This restraint is acquired through two mental or neural processes, facilitation and inhibition. Through association or acquired connections many mental or neural factors determine positively (or facilitate) our thought and conduct, and they prevent (or inhibit) other thoughts or sensations being our sole master. That is, the presence or absence of such acquired connections, or again the vigorous functioning or the lethargy of these connections, when present,

cite instances of conduct all the way from being influenced in our purchases by some clever advertisement we have read, to the slavish obedience of the patient in deep hypnosis or to the blind impulse of a panic-stricken mob. At the other extreme (restraint) we might cite instances of conduct all the way from the child hesitating, because of past sad experiences, before again robbing the pantry, to the justices of the supreme court deliberating individually and as a body for months before rendering an important decision. In short, as man becomes more civilized, more factors or conditions determine his thought and his ordinary conduct. Both become restrained. The many interests of life, the many aspects of each situation as it is faced, the many similar experiences in days gone by, the many deeds and sayings of other men, all these play a part in facilitating and inhibiting and thereby in controlling judgments and other behavior.

One type of suggestibility is especially characteristic of savages and barbarians, that is, the complete dominance, even tyranny of custom. Indeed, it is only gradually and only in advanced civilization that the individual becomes free at all to think and to judge for himself and to disobey mere convention; but even in the most advanced civilizations this freedom is sometimes narrowly limited and always somewhat limited. Thus even where you and I are legally and socially free to think and to do as we will, we are still in many matters the creatures of the group mind. We are so even where we try not to be so; for no man has succeeded in throwing off altogether the habits acquired in the school and in the social environment, even when convinced that he should do so. Here most radically minded

determine respectively whether we are genuinely deliberative or the mere creatures of impulses. In a sentence, our freedom from suggestion or hypnosis depends upon the complexity or degree of integration of our habits.

men are self-deceived. They try "to begin all over again;" but a later generation studying their lives sees what they themselves could not see, that they were children of their age and nation. Even men who in their day were bitter enemies and thought themselves poles asunder, seem to the historian of their period markedly alike. For example, the pagan philosopher of Greece and Rome and the contemporary Christian bishop seem to the student of the history of thought remarkably alike and far more alike than either is like any modern man, Christian or infidel. In short, even the most radical man frees himself only here and there from the group mind. However, there has come to be a marked difference between the barbarian and the civilized. The thoughtful and learned man tries to free himself, and democratic society tries in part at least to permit him to be free. As civilization advances both succeed to a greater extent.

Hence the history of individual freedom is one of the most interesting and important chapters in the history of civilization; and the struggle for freedom has been one of the bitterest wars that man has had to wage, a war not yet fought to a finish. Under primitive conditions not only the authority of custom is absolute but the obedience to custom is utterly blind. What later become matters of free reflective thought, the morals, the religious customs and beliefs, the civil and social customs, the political institutions, the education of children, and the study of man and of the world about him are for the most part in primitive society matters of blind social tradition, matters settled entirely by the group mind.

We may then conclude: To obey custom is always easier than to invent new and better methods. For the stupid and ignorant it is impossible to do more than to obey custom; but for some men in the community to become critical of and rebellious toward blind customs is dis-

tinctly a sign of growing civilization. As civilization advances the field of criticism and the freedom of criticism keep extending. Hence we may add as a further change in mental trait coming with civilization the growing freedom from custom and the corresponding increase in critical mindedness, the gradual throwing off of the herd behavior of primitive folk.

7. Man becomes more sociable.—Finally our list of the changes wrought by civilization in man's acquired mental nature includes increasing socialization. The child is in some respects markedly social, but is also blindly cruel and selfish; and the stupid child is more liable to remain so than is the intellectually gifted child. As we grow to adulthood we learn to adjust ourselves to others' feelings, interests and welfare as well as to our own; we learn to co-operate with others, to adopt the customs and etiquette of companions, to be reliable in promises, and to have many common ideals and enterprises. So also in the course of man's history, with increasing civilization we find as both cause and effect increasing socialization. Hordes become tribes, tribes nations, and nations empires. States originally held together and in order only by the strong arm become constitutional and law-abiding democracies. Slavery and serfdom give place to universal citizenship. Privilege and greed tend to be replaced by habits of patriotism and humanitarianism.

8. Conclusion.—Let us, to sum up, repeat our list of prominent changes wrought by civilized environment in man's acquired mental nature. (*a*) Man acquires higher ways of learning beyond the crude trial and success method of the brute. (*b*) Curious and loving to think, he in time consciously adopts as his enterprise the work of the intellect. (*c*) Analyzing further and further the world to which he responds, his conduct is governed more and more by the general and the abstract and less and less by crude

unanalyzed totals. (*d*) As he thus becomes more skillful and intellectual he becomes less crudely emotional. (*e*) Likewise he becomes less suggestible, that is, more thoughtful, more consistent, and farther sighted. (*f*) Finally, he becomes more and more socialized.[1] These changes wrought in general by civilization, are wrought within the civilized community to a yet greater extent by what we call culture and higher education. In general, as the savage stands between the brute and the civilized man; so the stupid, the ignorant, and the uncultured stand between the savage and the highly cultured man. Similarly, within the historical development of the highly civilized nations, increasing civilization and in particular increasing scientific knowledge have tended to bring about precisely these typical changes in the mental nature of the people, or at least of the highly intellectual individuals among the people. Thus wherever science has come and has advanced, man has risen farthest above a purely barbaric civilization; and if man in Western Europe to-day exhibits *on the whole* these six improvements in mental nature more than man ever has in his preceding history, this fact may be ascribed in part at least to the marvellous advance in scientific knowledge made in the past three centuries.

For further study read:

Thorndike, E. L., Animal Intelligence, 1911, 282–294;
Dewey and Tufts, Ethics, 1909, 17–90;
Bury, J. B., A History of Freedom of Thought, 1913, 7–21;

[1] Of course any such list of *general* changes is really only a vague statement of thousands upon thousands of *particular specific* changes. Moreover, the possibilities of combination or variation within such an enormous number are countless, which statement in turn suggests the important truth that the rate of progress in these mental changes may vary markedly from one particular trait to another. As individuals differ, so do peoples differ. Some individuals and some nations may be advanced in some traits and be behind in others, or hold to some traits and lose others.

Thomas, W. I., Source Book for Social Origins, 1909, 143–212, 335–439;
Sidis, B., The Psychology of Suggestion, 1898, 297–342.

For more extensive study read:

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Bury, J. B., A History of Freedom of Thought.

CHAPTER IV

PRIMITIVE KNOWLEDGE AND THOUGHT

1. Primitive thought.—Man had an implicit philosophy long before he had science. That is, before science he had a philosophy provided we mean by the word philosophy not an explicit doctrine but a general intellectual attitude or way of approaching and solving problems. Let us call this early stage of thought before science, *primitive thought*, and let us call its philosophy, *the philosophy of primitive thought.*

The expression "primitive thought" when thus defined remains ambiguous, for it may mean three distinct classes of belief. First, it may mean a stage in a people's history preceding all scientific thought. Second, it may mean a stratum of every nation's intellectual life, the beliefs of the stupid and of the ignorant who have remained intellectually primitive while part of the population has become cultured and critically minded. Third, it may mean prescientific beliefs held even by learned and thoughtful men. As preceding chapters have told us, there are so many things in this world for man to think about, and the thinking which he does depends so largely upon environmental stimuli; that part of a nation's population can advance in culture though the remainder does not, and an individual, or a people, or even an age can advance decidedly in thought regarding some matters though remaining markedly primitive in thought regarding other matters. For example, a proficient physicist can be utterly ignorant of political and economic science, a clever business

man can be foolishly superstitious, an age of great astronomical, physical, and geographical discoveries can be most primitive in its treatment of the criminal, the pauper, and the insane, or an age can be intensely interested and keen in its theological speculations but primitive in its beliefs regarding the physical environment and regarding the nature and causes of disease. In short, no man and no age is completely free from primitive thought.

Nevertheless, the name "primitive thought" is ascribed most frequently to the beliefs and customs of certain epochs in the history of civilization and to the beliefs and customs of the people of certain lands which have remained savage or barbaric throughout history. For example, three thousand years ago primitive thought prevailed everywhere. In the middle ages of Western Europe the historian finds an immense amount of belief and custom that should be called primitive. In central Africa the thought has remained primitive to our own day. Let us adopt this use of the term, primitive thought; but let us in so doing not forget that in studying primitive thought we are studying not only an ancient epoch, an epoch before science and in the early stages of civilization, but also an epoch many of whose beliefs and customs have obtained always and everywhere among the peoples of the earth, and whose beliefs therefore can be and should be illustrated by examples taken from every age and clime.

2. Three kinds of beliefs held by the primitive thinker. —In the life of every man, and so in the life of primitive man, three stages or levels of knowledge are to be found. The first stage is blind or unreflective knowing. Unreflective are those acts which we do merely because our inborn, or instinctive nature makes us sensitive to certain things and gives us ways of reacting to these things. For example, it is chiefly because of inborn nature that we are seekers after food, and fighters; that we fear darkness, solitude,

loud noises, and some animals; that we love and cherish the men with whom we spend our lives and that we fear or dislike the stranger. Unreflective is also what man learns merely by the trial and error, the hit and miss method, the method by which we learn to walk, to talk, to whistle, to grasp, to handle, and to throw. Finally, unreflective is what man does without foresight through imitating other men or by mere suggestion. Thus, in the course of his growth from childhood to manhood man tends to adopt blindly as his own habits the many beliefs and customs of his clan or tribe. In short, all such instinctive or blindly acquired traits constitute a distinctly unreflective mental level, a level in which more numerous and often more complex acts are possible than are possible for the higher brutes, but a level that remains animal-like rather than critical and rational and peculiarly human.

In contrast, the second level is genuinely reflective knowledge. Even the lowest savage does acquire some information toward which he is *critically-minded* and which he *verifies*. As a hunter and a fisherman, as a maker of tools and weapons, as a builder of huts and a kindler of fire, as an interested onlooker at the weather and seasons, the savage must learn and verify some of the properties, the effects, and the causes of those things to which he is obliged to react not only skillfully but also carefully and thoughtfully.

Besides the first and second levels of knowledge there is a third level. Let me call it speculation, in contrast to man's verified knowledge. Even primitive man attends to and is curious about many things whose effects and causes are not perceived or readily guessed and whose explanation when guessed cannot be readily tested. Therefore when he happens to attend to things to which he has no blind and completely satisfactory way of reacting or for which he cannot easily acquire a verifiable ex-

planation, he may speculate, he may guess, and to some extent at least he may argue out hypotheses. For example, he may explain the storm as the raging of a god, or insanity as the entrance into a man of some evil spirit, or the power of an adversary as the result of magic.[1]

To cultured moderns, these guesses or hypotheses of the primitive thinker may seem often wild and childish; but each of them can be psychologically explained and presupposes the same inborn mental nature as that possessed by the civilized man of to-day. In general, we can explain them by two mental laws, the law of analogy and the law of association. The law of analogy asserts that in reacting to a novel situation for which we have no well adapted (inborn or acquired) response, we react in a way which for our mental nature (inborn or acquired) happens to be most closely connected with that situation. Trite examples of such responses are the mistakes of the countryman visiting a city for the first time. At dinner he may drink out of the finger bowls. He may try to blow out the gas or electric light.[2] Granted this psychological law and granted the arising of some interest in things or events whose nature, causes or effects are not directly perceived or are not explained by traditional beliefs, we should expect men to explain these things or events in the way in which they explain whatever happens to be for them most analogous. The law of association asserts that whatever we happen to think together or to attend to together becomes connected in our future thinking. In this way we learn names, vocabularies, multiplication tables and

[1] Of course most such beliefs belong under the first type, being socially and blindly inherited; and perhaps the most that any imaginative primitive mind ever does, is to alter such beliefs or to extend them to new situations.

[2] Other examples are: savages believing the sails of a ship to be wings, or believing a locomotive to be a horse, or again, a city baby calling the first cow he sees, a dog.

poems; and in this way we learn the familiar properties of things. Granted that a man's mental nature at a given time is thus and so, it will often be none the less a *psychological* accident that decides what he happens to associate. That is to say, it will depend upon his environment rather than upon his mind. Let us call such an association, *an accidental association.* As an example of this, our environment rather than our mental nature has caused us to call one man Doe and another Roe. Again we often associate two things merely because we *happened* to attend to them at the same time. The two things may be logically, physically and psychologically unrelated or but remotely related and yet some striking experience may henceforth keep them closely related as objects of our thought. Many superstitions are examples of this truth. A valuable mirror was accidentally broken an hour before we met a serious misfortune, and our minds refuse afterward to keep the two events dissociated. In short, these two laws, the law of analogy and the law of association will explain most of the *novel thoughts* of primitive and civilized man; and to these novel thoughts, we are obliged to trace the origin of primitive speculation.

However, let us emphasize again the important point that *most beliefs and customs are unreflective* and that *the pre-eminent factor explaining the beliefs and customs of all peoples is the social environment.* In the main man believes unreflectively what his age and clan believe, he is interested in what interests his generation, he gets the intellectual set of his mind from his fellows. Hence it follows that in explaining any belief or custom of primitive peoples we must always emphasize the part played by social tradition. Whatever its origin may have been, even primitive speculation is seldom truly speculation but is largely group thought. It is seldom the free and critical thought of individuals.

It may help us if we give each of these types of knowing a name. The unreflective type we may divide into (1) *blind trial and error learning* and (2) *blind tradition.* The two reflective types we may call respectively (3) *experimental research, or investigation* and (4) *speculation.* And each of these types, we have seen, is to be found in primitive belief and knowledge.

3. Primitive verified knowledge.—We have now seen that responses to any environmental situation when examined as a *knowledge* of that situation may be divided into two types, the uncritical, or unreflective beliefs and the critical, or reflective beliefs; and again that these latter, the critical beliefs, may be divided into the experimental, or verified beliefs and the speculative, or unverified beliefs. Though the unreflective, or uncritical type of response is at the basis of all learning and discovery and of all tradition, this type is essentially primitive and non-scientific. Hence the true origin of science must be sought in the reflective or critical beliefs of primitive minds, and these we have seen are from the beginning of two types, the experimental and the speculative. Thus we may at once infer that the growth of these two types of knowledge is especially the subject-matter of the history of man's intellectual enterprise.

Let us consider first primitive experimental or verified knowledge. One of the wonders of the world is the amount of verified information man had before science began. Before science began man was expert in making utensils and weapons of stone, bone, and wood, in manufacturing pottery, in tilling the ground, in weaving cloth, in mining and working metals, in building canoes, boats, and ships, in quarrying and dressing stone, and in erecting large buildings, forts, and bridges. He possessed considerable information that may be called empirical geometry, physics, chemistry, engineering, and medicine. This

immense amount of prescientific skill should teach us the important truth: *the arts and crafts had to be far advanced before man could become a scientist.* Indeed our psychological insight should convince us that science could never have arisen until a vast amount of empirical information aroused man's curiosity toward the abstract and hidden nature of the things and events with which he was acquainted, a truth illustrated in the intellectual growth and training of every child.

This primitive verified knowledge is more than the indispensable condition of science. It is essentially the seed out of which science has developed. It is science in embryo. As such the refusal to call it science is somewhat arbitrary, for we are unable to point out any specific boundary between it and its later or scientific stage. Not altogether arbitrary, however, is our refusal to call it science; for science differs from it in being abstract and general. Science is essentially made up of universal propositions; whereas primitive verified knowledge is essentially particular and concrete. To employ a very important illustration: we may use a lever skillfully but may not yet have discovered the general truths of the lever. Or we may invent the wheel and employ it on a cart without having discovered that the wheel is a lever and that its merits depend upon the properties of the lever. In short, the typical lever, the wheel, and the balance scale may all be known to us, but to the lever in the abstract and to its general properties we may be completely blind. But even if we decide that science is to be distinguished by its generality and abstractness, we have to admit that the stages from the particular and the concrete to the general and the abstract are continuous, so genuinely continuous that any specific boundary line seems arbitrary. None the less both convenience and convention justify our refusing to call primitive verified knowledge science. It is

prescience. It is not sufficiently general and abstract to be science. It is not argumentative or ratiocinative. Its judgments are not *explicitly* generalizations, and its verification is not *explicitly* proof or logical deduction.

4. Primitive speculative knowledge.—As primitive verified knowledge is a parent of science so also is primitive speculative knowledge. Indeed, much of man's primitive speculation betrays the very essence of science; for it tends to be abstract and general, even though lacking the other essential trait of science, verification. Again, as abstract and general it comes nearer to being scientific in spirit than does the concrete verified knowledge; for its motive is explicitly an endeavor to explain. Finally, no matter how childish, it has the merit of being the result of wonder and curiosity. For these three reasons primitive speculation deserves extended study by the student of man's intellectual history.

Without attempting to define the terms rigorously and of course without assuming that the classes denoted by these terms are mutually exclusive, I shall for convenience sum up man's primitive unverified beliefs, whether unreflective or speculative, under the three headings, *magic*, *animism*, and *myth*.[1]

[1] The three terms are here used purposely in a vague, generic and non-technical sense. For example, under animism I wish to include animatism, supernaturalism (Marett) or dynamism (Leuba), and totemism. Under magic I include taboo, or negative magic, and fetishism. For a more detailed and technical discussion of various primitive beliefs and customs the student should consult the works recommended for further reading. Moreover, in this chapter we are studying not the beliefs and customs of any one people but rather the general tendencies found among many different peoples. Finally, primitive belief is *group custom* rather than *belief*, that is, it is nearly *thoughtless*. As a consequence, however sharply one can define types of customs, it remains doubtful if one can define sharply different beliefs without reading into them distinctions which belong to far more advanced thinking. In short, primitive thought is essentially

(a) **Magic.**—It is doubtful if magic, in the broad sense in which I wish to use the word, can be rigorously defined; for I desire to include within this class an array of beliefs and customs varying in different lands and varying sometimes widely one from another. These customs vary from the most childish superstitions to thoughtful and critical beliefs, and therefore from the most blind and casual associations to beliefs which reveal a genuine theory underlying them logically. Let me illustrate. On the one hand, a boy may carry a certain pebble in his pocket because of some vague feeling that it will bring him good luck, though he may not have or seek any ground whatever to explain how it can have this effect. On the other hand, we may find primitive medical beliefs and customs based upon explicit principles such as "like cures like," "strength can pass from the well and strong to the weak and sick."

Magic seems always to have played a large part in human life as it still does even in civilized communities. There are the multitudinous taboos of the savage; but the civilized also have their numerous taboos, such as the popular feeling which, even in cities of wealth and culture, compels the hotel and apartment-house proprietors to avoid numbering any suite "thirteen," or again such as the fear felt as we brag about good health. There are witchcraft and the arts of the magician from time immemorial, and there are to-day the fortune teller, the clairvoyant, the professional mind-reader, the charlatan, and the medically expert grandmother whose opinions rule though they conflict with explicit orders of the family physician. There are the wonder-working foods, drugs, images, lamps, and other natural and artificial objects of ancient life made familiar to us in the fairy stories so dearly

social, childlike and non-technical. Hence in discussing primitive thought some advantage is to be got by using a few generic terms rather than several specific and more precise notions.

loved in childhood, and we have with us still in our metropolitan cities wonder-working relics, marvellous patent medicines and foods, and a host of minor superstitions such as throwing rice at the departing bride and giving the playing cards an extra cut for good luck.

Does any thought or principle underlie such beliefs and customs? "Often none whatsoever," must be our answer if this question asks regarding the origin of magic and the psychological factors at work therein. However, the extensive belief and practice of magic probably did now and then tend to awaken in the minds of primitive and barbaric peoples a general belief even though a vague belief, which we may call "the principle implicit in magic." This principle is a theory of causation. It asserts that things can have a more or less *hidden power*, or *efficacy* which we moderns would call *non-mechanical*. Perhaps this can be illustrated best by the feelings ignorant people to-day have toward magnets, wireless telegraphy, dynamite, poisonous drugs, hypnotism, "personal magnetism," "will power," and similar instances of mysterious causal processes. This belief in hidden powers, or efficacies has from prehistoric days to our own been a part of popular philosophy and indeed has only in recent centuries been disappearing even from scientific thought.

Scholars are by no means agreed as to the origin of magic. Though many environmental agents may have been the actual stimuli to arouse such beliefs, the psychological aptitude of man for these beliefs is apparent in every child and in every ignorant adult. The absence of beliefs that in the cultured inhibit such superstitions leaves man's inborn nature open to the crudest and most accidental associations and analogies and open also to the suggestions of the group mind. And our inborn mental nature is itself especially susceptible to such beliefs, with its many instinctive fears, with its desires to lord it over

others, with its submissiveness to the impressive stranger, with its sexual instincts, and with its varied emotional responses.[1]

(b) Animism.—The second type of primitive speculative knowledge is animism. To most primitive thinkers almost everything seems to be alive and to many primitive thinkers almost everything seems to have a soul. In the latter case having a soul makes them alive. But in believing things to be alive the primitive thinker has not the critical and precise notion of life which the modern biologist entertains. To be alive means to move one's parts or members, to do things, to change or transform oneself, to go from place to place, to have offspring. Such even to-day is life as conceived by children and by the ignorant. If these are criteria of life, then the sun, moon, and stars, the clouds, the wind, the storm, the ocean, the brooks and rivers, the soil as the seeming mother of plant, insect, and reptile, are one and all as truly alive as are what we call animals and plants. Moreover, precisely as the ignorant man of to-day accepts naïvely the presence of life as a thoroughly sufficient explanation of motion, change, growth and reproduction in animals and plants; so the primitive thinker accepts life also as the explanation of the motions, the changes, and the coming into being of virtually everything. Thus if the moon is alive, of course it moves and hides. If the earth is alive, of course it brings forth. If the storm is alive, of course it rages and destroys. If the sun is alive, may not the stars be its offspring?

But things have often a soul also. Here again we must

[1] The problem of the origins of magic takes us back far beyond the limits of history and our ignorance of the actual origins is extreme. The subject is too vast and the differences of opinion are too many even to be summarized in this book. Such a summary the student can secure in the books referred to below.

not ascribe to the primitive thinker the notion of the soul as conceived by more critical thinkers, rather we should try to imagine the soul as conceived by children and the ignorant. It is a second sort of person, a man's double. It is a sort of body. It can at times be seen and can wear clothing. It can talk, and do many things our bodies can do. Yet it is also markedly different from our bodies. It is often invisible, it can go through obstacles impenetrable to the body, it can travel with great rapidity and to places to which the body cannot go. It is less tangible, less solid than many objects, being like breath, bodily warmth or a shadow. Hence the very names, *anima*, *psyche*, ghost, soul, wraith, shade, spirit.

Many experiences could have given rise to the belief in such an entity as the soul. In the first place, we know that young children and primitive men do not distinguish between dream experience and that of waking life. Objects and events in the dream are believed to be present in the same way as they are to sense perception. Hence, since in their dreams they see and talk with the dead, the belief naturally follows that the latter must still be alive and be able to travel back to them and to enter even the most securely fastened abode. The living too in their dreams can gain exit from closed abodes, can travel far, can hunt with the dead. In the second place, the phenomena of death, insanity, mania, trance, delirium, hysteria, and even falling to sleep, and awaking from sleep suggest as their explanation the departure or return of some such entity as the soul from or to the body, or the arrival and entrance into the body of a foreign soul, friendly or hostile as the case may indicate. In the third place, many other experiences may have played a part in arousing the belief in souls, for example, anger and its regretted deeds, unusual strength, unusual obstacles or accidents to man's enterprises, echoes and other unexplained noises

in nature, or the sudden and unexpected appearance and disappearance of wild beasts and birds. But all of these explanations of the origin of animism may be *converting cause and effect.* Once in existence animism would be a probable and satisfying way of explaining such facts and yet these facts may have had little to do with the actual origin of the hypothesis. Animism may have been of *group origin* and *far less rational.* Thus its origin may have been totemism. That is to say, the soul is the totem or a piece of the totem in each member of the clan, be this member a man, an animal or any other object. For example, if the totem of the clan is the kangaroo every object that belongs to the clan has the "*nature*" of the kangaroo in him or it. This something, or nature, is then the original soul.[1]

Once present, the belief in souls can lead the primitive thinker to ascribe souls to every object that he judges to be alive, and it helps him explain many things besides those things, whatever they may have been, to explain which the belief originated. Indeed, it explains why things are alive and also why they seem sometimes to be asleep or dead. It explains sickness, epidemics, insanity, epilepsy, and magical and religious powers. It explains why events in nature seem to us often to have an emotional and personal trait; for nature seems to punish us, to fight us, to hate us, to smile upon us, or to befriend us. The storm rages, springtime is merry and benign, wild beasts are enemies or friends. Once things are thought to have souls, and especially such things as are man's constant companions, the sky, the sun, the moon, the ocean, the earth, the storm, the neighboring mountain, and many other things, the soul in them may gradually become somewhat dissociated from the things themselves which

[1] Here again our ignorance is extreme and the opinions of scholars differ.

these souls inhabit. This is probably at least one factor that brought about the belief in spooks, nymphs, demons and gods as distinct persons, persons that can be pictured, named, persons that have a character and a biography. Hence in time came the polytheism such as we find in classical Greece, a polytheism with all the marks and associations of its primitive totemistic and animistic origin.

Animism, like magic, has been from prehistoric times a most important part of popular philosophy, and has never been thoroughly eliminated even from scientific thought. Like magic it has been an important element throughout history in the conception of causation, and has been so not only in so-called superstitions but also in scientific beliefs. Let me illustrate. The soul and its powers and faculties have always been a part of popular psychological explanation. Indeed, few even professional psychologists quite escape animism. The soul's departure from the body has always been the popularly received explanation of death. Life has always seemed to the ignorant and, until recent centuries, even to the biologist, the working of a special hidden agent, the soul or "the vital principle." Even the things and events under study in chemistry and physics have been very slow in getting explained non-animistically, for "substances" and "forces" are more or less animistic entities; that is, they are agents with mysterious powers, and they are ultimates which themselves seem to us to require either no explanation or less explanation than do the entities or processes which we explain through them. For example, how natural for us it still is to think of electricity as a power, an agent, a doer, a sort of spook.

(c) **Myth.**—Myth, the third type of primitive belief or speculation, usually presupposes the other two, magic and animism; but myth is closer to being explicitly a theory

than are they. A myth is a story or yarn used intentionally to explain some thing, event, belief, or custom; for its very function is *not to interest but to explain*, and by this it differentiates itself from other stories. As an explanation it is perhaps the clearest instance of what we have called a response by analogy. The inventor of the myth, be this inventor the group mind or some individual man, in his ignorance of the true explanation of the objects or events in whose origin he is interested, readily explains their origin after the analogy of that with which he is best acquainted, namely, human life and conduct as understood by primitive thought. To illustrate: the myth maker often explains the origin of things after the analogy of human birth. To him the stars may be the offspring of the sun and moon. Again, whatever in nature suggests to him human plans and emotions readily gets interpreted by a myth. Finally, the actual origin of the tribe, the origin of its customs and industries, and in particular the origin of its religious ritual are matters completely forgotten by primitive peoples; but they are matters which readily suggest some analogy to things better known and accordingly are explained by a myth.[1]

Among the myths which interest especially the historian of philosophy are the ancient cosmogonies, and in particular, those found among the ancient peoples of India, Babylonia, Egypt, and Greece. They suggest the wonder of the primitive thinker at the world about him as he saw it and knew it, and they foretell the coming of the time when man was to find a better way of satisfying his curiosity than by inventing stories. Moreover, these cosmogonies are distinctly instances of explaining nature by means of

[1] Once in existence the myth may be handed on from people to people, and from generation to generation with comparatively slight changes or additions until it reaches the hoary age of many of the most famous myths.

analogies and as such represent one of the most inveterate philosophical habits of man. Indeed, man has been outgrowing myth-making very slowly; and the great majority of people in civilized lands to-day still explain the origin of nature and of man by myths and still interpret the phenomena of nature after the analogy of human plans and purposes. Only as we become well informed in physical and biological sciences and only as we acquire habits of seeking explanations of nature's events in terms of the propositions of these sciences, do we outgrow the childlike intellectual satisfaction given by myths and other human analogies. In short, we all feel much more at home in nature when we can explain nature and our place in nature in terms of human conduct, human interests and human emotions; that is, we still feel so, provided we can find a myth sufficiently consistent and ingenious not to arouse our intellectual scruples.

5. The influence of social organization.—A further trait of primitive thought is emphasized by some sociologists. This is the influence of the tribal social organization upon man's philosophy of life and of the world about him. For example, a monarchical society is liable to think of the world as a sort of monarchy; and a group of tribes with fixed boundaries between territories that no one may transgress without dire punishment, may think of the universe in similar fashion, as a system of realms with harmony kept between them by a sort of omnipotent world custom. Psychologically, of course, this trait is to be explained as a response by analogy; and in particular it is to be explained by the fact that the social organization of a primitive man's tribe is the *most general* or *universal organization* with which he is acquainted. Hence when he reflects regarding the physical environment and its order, he interprets them in terms of the only system he knows which seems commensurate. One of the most familiar

instances of this analogy is the medieval conception of the world, reflecting the political and ecclesiastical hierarchy in the days of feudalism and papal supremacy. Europe was organized through feudalism and the supremacy of the pope like a vast ladder reaching from pope to serf; and correspondingly the world was conceived as a similar ladder reaching from God through the angels and the church down to man and to nature below man. Another example is to be found among some peoples of Australia, who divide what we call nature or the universe into the same totemistic or clan groups as those into which their tribe is divided. In other words, man's first classification of all things, man's first list of categories, man's first general philosophy may have been a mere reflection of the tribal organization.

6. Conclusion.—We have now studied in briefest and most general outline, the story of primitive thought. In the first place, this study tells from what science has grown. Science has grown from two primitive types of knowledge, first from the thoughtful skill, or so-called empirical wisdom, such as that of the practical builder or machinist, and second from the unverified speculations or naïve theories, such as the animistic myths. In the second place, primitive thought reveals in contrast to itself some of the essential attributes of scientific thought. In contrast to practical or empirical wisdom, science is general and abstract. Prescientific skill is a knowledge of concrete particular things or situations; whereas science is a knowledge of universals of which the particular things are examples or instances. In contrast to unverified and naïve speculation, science is a critical research or investigation followed by verification. The business of science is to discover facts, to explain them and to demonstrate or verify the explanation.

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CHAPTER V

FROM PRIMITIVE THOUGHT TO SCIENCE

1. Introductory.—The historical evolution from primitive belief and custom to science has been long and difficult. As we have seen, no people has really completed this evolution and few nations have ever of themselves reached a point where the scientific enterprise is deliberately undertaken. And even where they have reached this point, only the intellectual leaders have reached it, not the people as a whole. Nay rather the intellectual enterprise has always met resistance from the folk or the conservative many; and as a consequence, wherever science has appeared some conflict has always arisen between it and the older belief and custom. Moreover, the way upward has been not only difficult, but also long, long even for the most intellectually gifted leaders; for, as we have seen, primitive belief and custom had to undergo an extensive development upward before science could even begin, and after science had begun the old beliefs and customs continued to exist interacting with and influencing the new beliefs. This development of primitive belief and custom upward toward science, its influence upon science and its conflict with science are the subject-matter of the present chapter.

2. Primitive custom and religion.—It is desirable to introduce at this point into our discussion the word *religion* as a technical term. This word as at present used is highly ambiguous. It is used by many historians to denote virtually the sum total of the beliefs and customs of primitive peoples as well as to denote certain related

beliefs and customs in every stage of civilization up to the very highest. On the one hand, this usage is justified by the continuity in evolution between the lowest beliefs and customs and the highest religion; yet, on the other hand, primitive beliefs and customs are the parents not only of the higher religions but also of art, of science and indeed of every phase of civilized life and experience. Here, as elsewhere, evolution is a process in which the parent gives birth to diverging or differentiating offspring.[1] Accordingly let us not call the genuinely primitive beliefs and customs religion but the parents of both religion and science. And though admitting a complete developmental continuity and a closer likeness between primitive customs and religion, let us regard religion as a later stage in human evolution, a stage, it is true, which precedes science but also a stage which continues to live along with science, in part as the rival of science and in part as a necessary complement to science in the complete life of man. Let us first study briefly religion, this earlier offspring of primitive belief and custom.

3. National and international religions.—The social amalgamation of earlier tribes and clans into city-states or into nations, best exemplified for us in the history of Israel, Greece, and Rome, has usually had as one of its consequences a marked advance in primitive thought. It has tended, though not always successfully, to transform diverging local cults and worships into great national religions, and these religions have tended to be intellectually and morally superior to the earlier local beliefs and customs. This advance is due to a number of factors, the

[1] For example, in the higher vertebrate series the ancient reptile was the parent not only of the birds but also of the mammals, and let us not forget, the parent also of the recent reptiles who may illustrate for us the non-progressive or conservative type usually to be found in every evolving series.

chief of which we may call generalization. For example, many local deities may be identified and thus may become a common national deity. Many diverging local cults and rites may be succeeded by a national ritual of the city temple under the control of a priestly class. Again, many diverging magical practices and taboos and many other social customs may be supplanted or generalized by becoming a national standardized system of customs and laws. This process of nationalizing local customs and beliefs must often have led the intellectual men to criticise and to outgrow the savagery and the inconsistencies of the older order. Moreover, it must have suggested the new problems and the new thoughts that led to the higher conceptions and nobler ideals actually to be found in the great national religions.

Besides nationalizing and generalizing religion, the socializing of the people that takes place when tribes are united into nations and nations into empires produces other important effects upon religion. The very socializing of the people raises their morals and laws beyond the crude and narrow customs of the clan or village. Indeed it tends to transform customs into morals. It tends to transform blind obedience to the group mind into thoughtful and critical social behavior, for it breaks the rigid rule of local customs and gives man a new social world with new social laws and larger social interests. And, remember, as are people so are their gods. The gods become the gods of justice and humanity, the gods not only of the clansmen but of the stranger, the gods not only of the nation but of mankind. Moreover, a corresponding tendency arises, a tendency to outgrow the savage myths and crude ritual of the earlier local religion and to idealize the life and character of the gods. Both of these facts are evident in the writings of the Jewish prophets and in the Greek poets and dramatists of the golden age.

Again, the socializing and nationalizing of religion is correlated with a great economic and political advance of society. Empire building brings greater wealth and economic stability and the disappearance of petty and local wars. This advance in turn influences religion. Man feels less dependent upon his gods and more dependent upon society for his prosperity, and therefore the crude and savage magic by which he once won his wealth and his wars tends to disappear. New needs for the gods take the place of the old needs, for now the gods are needed rather as the defenders and protectors of social justice and humanitarianism. Man now begins to need a god of righteousness, a god that protects the weak and the lowly, a god that is not served by magic and sacrifice but by doing justly, by walking humbly and by a contrite heart.

Finally, universalizing the local into national and international gods tends to dissociate the gods from the crude totemism and other local characteristics of primitive religion. That is, it makes the gods more abstract, more distant, less anthropomorphic, and it tends toward monotheism. God no longer dwells in temples made with hands, God no longer thinks and does as man does. God no longer can be pictured in the crude forms of earlier thought, for he transcends the images and pictures of man's thinking. In short, God becomes inscrutable and transcendent.

Unfortunately the story of the rise of the great national religions of ancient civilization out of the prehistoric and primitive beliefs and customs is still largely unknown. It is unknown because it preceded for the greater part the days of historical records. Consequently our efforts to reconstruct the story from the monuments and the vestiges of the older epoch surviving in the later epoch is of necessity tentative and full of mere conjecture. However, historical and anthropological research during recent decades has let a flood of light into what was previously

a realm of almost complete darkness. If little is known of the actual details and sometimes little even of the main outlines of these ancient evolutions, modern scholars are agreed regarding at least a few general propositions. Every great national religion evolved by stages, admitting always of a psychological and sociological explanation, from local and often exceeding primitive beliefs and customs. This evolution was due to and its pathway was determined by two factors, the beliefs and customs from which it started and new environmental agents. These environmental agents can be of many different sorts. Sometimes they are peculiar to the particular people; and sometimes they are of world-wide influence, as the life and thought of one nation interacts with the life and thought of other nations. At times national disaster, and at times economic, social and political progress are important factors. Each of these factors should be illustrated. Every religion and markedly the ancient religions exhibit vestiges of the primitive customs from which they are descended. The gods and demigods, the festivals and fast days, the sacrifices and sacraments, the ritual and ceremonies, the priestly class, the commandments or religious laws and taboos, one and all can be traced to much older days when they, or the beliefs and customs of which they are vestiges, belonged to some savage local cult. Some cults seem to be genuine descendants of the older local religion; but in the ancient Eastern Mediterranean world is to be found evidence of widespread religious influence from people to people. In later days, the days of recorded history, the influence of oriental religions upon Greek and Roman religions was widespread. Evidently the religion of Israel was influenced by national disaster and by political bondage. Finally, in modern history we have a familiar instance of the effects of economic, social and political progress upon religion. The protestant

reformation had evidently behind it the great social, political and economic changes that brought modern Europe into existence.

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4. From religion to science.—In the history of ancient civilization only one nation, Greece, developed by its own efforts beyond the religious stage to a stage of civilization that may be called scientific. Other nations, and above all, Persia and Israel, grew in religion decidedly beyond the

primitive beliefs and customs of the prehistoric peoples of the Mediterranean region and exerted powerful religious influences upon Mediterranean civilization; but Greece alone exerted also a distinctly scientific influence.

However, behind Greek science and of necessity behind the first stages of any indigenous scientific evolution, stands religion. Religion gives *in part* the setting or the frame work, the general outlook, and the starting point for the more intellectual enterprise of the few leaders who discover and seek to solve problems that we may call scientific. Indeed, the general world hypotheses to be found at the beginning of Greek scientific thought were *partly* religious and prescientific, and Greek scientists never *completely* outgrew these religious world hypotheses. In other words, religion gave Greece the general bounds within which her science developed and from which man's intellect failed to make its escape until the days of modern science.[1]

5. The conflict of science with religion.—The process of outgrowing the conceptions and beliefs of an earlier prescientific era gives rise, as we have seen, to a conflict between the old beliefs and customs and the new thought. It does so from two psychological causes. First, a conservatism exists in every individual adult and in society that makes the formation of any new habit which conflicts with strongly established habits or customs exceeding difficult. Second, progress in civilization, and of course in science, is essentially the enterprise of the variable gifted few and not of the conservative mediocre many. Hence the theory and practice of the few must of necessity tend always to be in advance of the beliefs and customs of the many.

No wonder then that in both the ancient and the modern

[1] These matters in the history of Greek science will be discussed further in Chapter VIII.

world the prophets of science, as the prophets of religion, have often been hailed as the enemies of man and of religion and have accordingly been persecuted. In the beginnings of science especially the teacher of new theories has seemed to society to be the blasphemer of the gods, the corrupter of the youth, and the destroyer of law and custom. Of course it depended upon the particular new theory and again upon the particular social and religious environment how severe the conflict became and how long the conflict lasted. In Greece it is remarkable to what a high degree the new theories were tolerated. Still Greek science had her martyrs. In the modern world science and scientific research have had to struggle for the past six centuries to overcome the resistance offered by the conservative many and unfortunately this resistance has been offered frequently in the name of religion. Almost every science, geography, astronomy, medicine, geology, biology, anthropology, and the history of religion have seemed at first antireligious, heretical or blasphemous. However, if we remember the crude and primitive beliefs and customs of medieval Europe and recall the tremendous change in the thought of Europe brought about since the year fourteen hundred, the rapidity of the change rather than the severity of the conflict will seem remarkable. Indeed, that science ever did arise anywhere and ever did win for man some freedom of thought was probably made possible only by the fact that society was undergoing many other changes at the same time. That is, Greek science came in days when the Greek world was progressing religiously, economically, socially, and politically; and similarly modern science has come amid the vast changes that have created modern Europe.

Fortunately, as a society grows intellectually and as it feels the benefit of increased knowledge it tends to become consciously or deliberately tolerant toward scientific

progress; not, however, that it has ever become in any civilization, even in our own, consistently and completely tolerant. Still, in Greece, in the Roman Empire and in our own days history bears witness to an amount of tolerance on the part of society at large toward man's intellectual enterprise which is remarkably great compared with the little freedom possible when the individual confronts the iron rigidity of custom in primitive and early society. In fact, the amount of tolerance is itself an index of advance and rank in the scale of civilization, and accordingly in both the great epochs in western civilization, the ancient and the modern, man has won a liberty of thought impossible, or if possible no doubt disastrous, in the lower stages of civilization.

For further study read:

Bury, J. B., A History of the Freedom of Thought (Home University Library).

For more extensive study read:

White, A. D., A History of the Warfare of Science with Theology in Christendom.

6. The mutual influence of religion and science.—As the conflict between science and religion has been discussed and as our chief concern will be with the history of science, we may here best consider their mutual influence throughout history. The conflict has often been severe and unworthy, but as the historian of philosophy looks back upon the centuries passed he cannot fail to see right on both sides and mutual benefit from the struggle. Both sides have proved themselves to represent permanent interests of the human race and therefore both religion and science belong to the complete life of man. As a society with purely scientific and no artistic interests would be monstrous and as no such society ever has existed even if it can exist; so also a scientific but non-religious society

has never really existed and if it does tend to develop it soon reverts to type. Indeed, the most exclusively intellectual epochs, such as the age of Pericles or the eighteenth century in modern Europe, are liable to be followed by a period of romanticism and so revert to the more nearly complete life which is both intellectual and emotional. On the one hand, this struggle between science and religion has forced science to recognize the other fundamental interests of mankind and to harmonize its interests with them wherever they have tended to be ignored. On the other hand, religion has greatly profited by the struggle, for religion has tended to be purified and ennobled. Religion as the more popular and the more ancient enterprise has carried with it through the ages an immense amount of primitive belief, thought and custom. Often its noblest and essential elements have been hidden under a burden of magic, ritual and myth; and the struggle with science has helped the genuine religious insight of man to discover these noble and essential elements and bring them to the light of day.

CHAPTER VI

THE TWO MAJOR PERIODS IN THE HISTORY OF EUROPEAN PHILOSOPHY

1. The three major periods of history.—The history of western civilization may be divided into three great epochs. These epochs are respectively the *River period*, the *Mediterranean period* and the *Atlantic period*. The river period includes the great civilizations along the river Nile and along the rivers emptying into the Persian gulf, the Tigris and the Euphrates. It extended in time from at least four thousand years before Christ to the days when Greek thought, culture and military leadership dominated these more ancient civilizations, that is, to the days of Alexander the Great and his successors.[1] The Mediterranean period includes the civilizations in the lands bordering directly upon the Mediterranean Sea. It extended in time from the ancient civilizations, so recently revealed to us by archeological research, in Mycenæ, Crete and other places to our modern days when the Atlantic Ocean has become the chief carrier of the world's trade, that is, from at least the third millennium before Christ to the end of the middle ages following the decline of the Roman Empire and in the eastern Mediterranean even to recent centuries. The third, or Atlantic epoch is the present era

[1] That is to say, the river civilization then became absorbed by or taken into the Mediterranean. Similarly with the end of the Mediterranean period, the Mediterranean culture was absorbed by or taken into the more extensive culture of the modern or Atlantic world. In a genuine sense therefore Egyptian civilization has never ceased, nor has the Mediterranean.

in which the nations of modern western and northern Europe and their colonies have come into existence and have become the leaders in culture, wealth and military power, and in which the Atlantic Ocean has become little more than an inland sea on whose shores these nations are grouped, leaving the Pacific the only true ocean. That is, the third epoch extends in time from the inroad of northern peoples into the Roman Empire to our own days.

2. The first coming of science.—In what period of history did science first appear? That is, where and when did a few men deliberately begin to give up their prescientific beliefs and endeavor to explain some things in ways we call scientific? Scholars agree that this first took place *in Greece in the sixth and the succeeding centuries before Christ.* Hence it was in the Greek world, in the days of Greece's greatest glory that men began to ask questions never before asked and to seek information which to obtain was to revolutionize man's thought and conduct. Then and there science after science began, for by the end of this period we find in existence astronomy, meteorology, mathematics, physics, biology, medicine, psychology, geography, history, grammar, logic, metaphysics, esthetics, ethics, and politics.

Wonderful as these centuries were, they were not miraculous, as they would seem to us to be, if ignorant of the environment of the Greek peoples and of the civilization of preceding centuries, we believed them to be the dawn of history. This they were far from being; for at that time one of the three great epochs into which the history of western civilization is divided, was drawing to its close and the second epoch was already well advanced. In short, the beginning of science had before it as many centuries of civilization as have followed it. Before it were the civilizations of Egypt, Babylonia, Assyria, Asia Minor, Phœni-

cia, and that of early Greece itself. So to men in the sixth century B. C. the civilized world seemed old, as old as it seems to you and to me. Moreover, these civilizations were wonderful; how wonderful is revealed to us by recent archeological research. Perhaps their most remarkable aspect is that such gigantic buildings and public works, such distant sea voyages and vast military enterprises, such division of labor and complicated, well organized governments, such beautiful stone work, pottery and metal work, such wealth and refinement, were possible before the days of those sciences to which our modern civilization is so deeply indebted. For example, it is all but incredible that the builders of the pyramids and the vast temples of Egypt were quite ignorant of either mathematical or physical science.

Of course, they must have had a vast amount of empirical information, for instance, empirical geometry and mechanics. They could measure land, lay out and proportion the angles of buildings, cut stone so it would fit, and transport long distances stones weighing many tons. Such information must have been got gradually in the course of centuries by the primitive (or trial and error) method, and handed down from one generation of craftsmen and engineers to another.[1]

Let me then repeat, had not remarkable civilizations preceded the sixth century there would have been no Greek science; for the scientific attitude and the scientific problem are found not among the grossly ignorant but

[1] All this suggests to what an enormous extent the skill even of our modern craftsmen, engineers, statesmen, judges, merchants, bankers, soldiers, physicians, has been acquired by trial and error and by way of tradition, rather than by science, even though science has made an immense amount of our skill possible. In short, we find Egypt wonderful but not inexplicable, for we can see going on in some places right about us such trial and error processes as made Egypt possible.

only among men rich in the possession of empirical and practical information. Consider again a few simple illustrations. The lever had to be well known and skillfully used before men began to investigate and explain it. Human diseases had to be well known in their symptomatic or empirical aspects before it entered into the mind of man to investigate scientifically the causes of these diseases. The heavens had to be watched and studied ages before any genuinely scientific astronomy could begin. A large amount of useful arithmetic and geometry had to be known before men could begin to discover and demonstrate the highly general theorems of elementary mathematics. Masterpieces of art and literature had to come into being before a scientific interest in the principles of art and rhetoric could arise. Language had to be spoken grammatically long before men ever raised the problems we study in our text-books on grammar. Various forms of government with elaborate constitutions and legal customs had to be in existence before men began to study politics scientifically.

Much as the Greeks of the sixth and the three succeeding centuries owed to their neighbors and to their ancestors, they owed much also to their own environment and especially to the great changes in their life and thought wrought by the events of the eighth and seventh centuries. These centuries were times of great endeavor. In them colonies from the older Greek cities were founded in almost every nook and corner of the Mediterranean and Black Seas. Hence they were times in which a large amount of geographical and other information was flooding into the Greek world; and they were times that to-day we should call progressive, for colonists are pioneers, and pioneers are of all men the most venturesome, venturesome in breaking away from the traditions and customs of the old home, and venturesome in tolerating new customs

and beliefs. In short, the centuries immediately preceding the birth of science saw a great change in Greek life, thought and custom, a change comparable to the change wrought in modern Europe by the discovery of America and of the way to the Indies round the Cape of Good Hope.

3. The major periods in the development of scientific thought.—We have mentioned three great periods in the history of civilization and we have seen that the dawn of science lies well within the second period. Into what major periods can the development of science in turn be divided?[1] As there have been two great periods in European history during which science has existed, so of necessity there have been two great periods and two only in the development of science. I say "of necessity" because scientific development is dependent upon the great political, social and economic factors which make up its environment and because science is itself, as the product of the intellectual life of civilized peoples, no more than a part of their civilization. Let us call these two major periods of scientific development respectively the Greco-Roman (the Mediterranean) and the modern (the Atlantic).

The remainder of this book will be given to the study of the philosophical development of Europe during these two epochs. The first task will be to give some account of the primitive thought to which Greek scientific thought was peculiarly indebted and then to trace in its four periods

[1] Here I must call attention to the impossibility of giving a definite boundary to most historical periods. For example, when did the chief center of civilization shift from the Mediterranean to the northern nations of Europe? The transition was gradual and therefore the end of the Mediterranean period and the beginning of the Atlantic period are not adjacent points whose date can be definitely fixed. Rather the two eras overlap for centuries and it would be thoroughly arbitrary and quite misleading to designate the date of a minor event such as the so-called fall of Rome in 476 as the point of transition.

the development of Greco-Roman philosophy. The second task will be to give an account of the philosophical development of modern Europe. We shall now turn to the first subject, the development of philosophic thought in the Greco-Roman period.

For further study read:

Myres, J. L., The Dawn of History (Home University Library).

PART II

ANCIENT PHILOSOPHY

CHAPTER VII

THE MEDITERRANEAN PERIOD

1. Greek science and philosophy.—Man's scientific enterprise within the Mediterranean, or Greco-Roman period begins in the Greek cities on the western coast of Asia Minor and in the Greek colonies in Sicily and southern Italy. Later, that is, during the fifth and fourth centuries B. C., scientific thought and research become centered in Athens. Finally, with the Alexandrine empire Greek science and culture are carried throughout the eastern Mediterranean region, and later to Rome and throughout the western Roman Empire. Examined from our modern point of view, the Greco-Roman period seems an epoch of splendid beginnings in science to which mankind will forever remain indebted, but none the less an epoch in which few sciences really got more than started upon what has become their modern line of development. It was an epoch in which primitive thought was outgrown only in part and permanently outgrown only in a few places, an epoch marked by critical insight and brilliant speculation rather than by verified hypotheses, that is, an age of thought rather than an age of experimental investigation. As an age of thought its greatest scientific achievements were philosophical, mathematical and astronomical; whereas firm foundations for such sciences as physics, chemistry, geology, anatomy, physiology, psychology, sociology and economics and the scientific study of the history of life, of man and of human institutions, were but begun. Compared, however, with the thought of the preceding era and with the thought of sur-

rounding peoples, the various scientific enterprises and achievements of the Greeks were astonishingly great and numerous; and they seem even greater when we recall that the Greeks began the task and showed the way, whereas the moderns began by first being instructed by the Greeks.

Unfortunately the golden age of Greek civilization was a very short period, lasting only a few hundred years (pre-eminently the sixth, the fifth and the fourth centuries B. C.); for Greece was fated to remain a group of rival states which could not unite and permanently co-operate. It may be idle to try to guess what Greece might have given the world, could these city-states have become a federated republic, similar to modern Switzerland, for example, and could they have given united loyalty to the leadership of their great men; but it is not idle to assert that political and social disintegration shortened this most wonderful of epochs. That is to say, Greece had either to unite and rule the world or to be ruled by the strong arm of the foreigner who could rule the world. The fates, or rather the inability to solve her economic and social problem,[1] made Greece incapable of choosing the former. The political effect was that the city-states of Greece lost their independence and became, first, part of the Macedonian empire and, later, part of the Roman. The cultural effect was that the learned Greek and his pupils became the schoolmasters of the Mediterranean world, and, as is so often the case with schoolmasters, ceased to be intellectually progressive. In other words, after the downfall of the city-states the scientific enterprise commences to be given up and its place is taken more and more by other interests and by a mere endeavor to acquire what in the meantime has become a traditional wisdom.

[1] Especially the struggle between the rich and the poor, the struggle due to the inability of the freeman to compete successfully with slave labor.

One other misfortune also checked the intellectual enterprise, a misfortune due likewise to political and social changes. It has been well called, the (religious) loss of nerve. Greece was not destined to develop her ancient folk religions into a highly ennobling and stimulating national religion. The religion of the enlightened and scientific gave way more and more to the primitive religious tendencies of the folk and to the inroad of many oriental cults and tendencies. The outcome was a steady and increasing religious decadence, ending in a religion of magic, animism, and crude suggestion.

For further study read:

Dickinson, G. L., The Greek View of Life;
Livingstone, R. W., The Greek Genius and Its Meaning for Us, 1912;
Mahaffy, J. P., A Survey of Greek Civilization, 1896;
Burnet, J., Early Greek Philosophy, 2d ed., 1908, 1–35;
Gomperz, T., Greek Thinkers, Vol. I, 3–42;
Thilly, F., History of Philosophy, 1914, 7–14.

For more extensive study read:

Mahaffy, J. P., What Have the Greeks Done for Modern Civilization? 1910;
Zimmern, A. E., The Greek Commonwealth, 1911;
Botsford and Sihler, Hellenic Civilization (Records of Civilization: Sources and Studies), 1915.

2. The periods of Greco-Roman science.—From the foregoing it follows that there were two chief epochs within the Mediterranean period, the golden age (6th, 5th and 4th centuries B. C.) and the age of decline; but each of these epochs may be properly divided into two subperiods, giving us in all four periods of Greco-Roman science. The golden age, before Athens becomes the most prominent city in Greece for its culture, is usually called the *early or presophistic period.* It extends roughly from 600 B. C. to 400 B. C.[1] The second period may be called

[1] Of course such dates do not apply to all or to any specific parts

the Athenian period, not, mark well, because it is exclusively Athenian but because of the prominence within it of Athenian culture and influence. Its dates are 470 B. C. to 300 B. C. The age of decline may properly be divided into two periods, *the Hellenistic* and *the Roman*, if for no other reason, at least for the reason that the extension of Rome's dominion to include the eastern Mediterranean countries and neighboring lands had tremendous consequences to the entire civilization of these peoples. The Hellenistic period begins in the time of Alexander and lasts, let us say, till the age of Augustus Cæsar, that is, from the middle of the fourth century to the Christian era. In it Greek culture is carried far and wide throughout the Mediterranean world; and Rome, the future mistress of the world, becomes Greek in culture. The Roman period extends from the first century before Christ to the days following Gregory the Great, till about 700 A. D. when the decline of the old culture in Italy, Spain and Gaul has nearly reached its lowest point.

Let us in the next chapter study briefly the influence of primitive thought upon Greek science and in the immediately following chapters the history of Greek philosophic thought after the birth of science.

Mediterranean Period, 600 B. C.—700 A. D.	Golden Age, 600 B. C.—300 B. C.	Early Period, 600 B. C.—400 B. C.
		Athenian Period, 470 B. C.—300 B. C.
	Age of Decline, 350 B. C.—700 A. D.	Hellenistic Period, 350 B. C.—1 A. D.
		Roman Period, 100 B. C.—700 A. D.

of the Greek world. Science began in some parts much later than in other parts and schools of thought endured longer in some parts than they did in others. Giving any period definite dates is, as we have already seen, a mere convention however useful and helpful a convention.

CHAPTER VIII

FROM RELIGION TO SCIENCE IN GREECE [1]

1. Greek religion.—Of all religious developments that of ancient Greece, the mother of science, is of greatest importance to us in beginning the study of the history of philosophy. Unfortunately here, as in the case of other ancient religions, the historian has to work backward from the historically known to a period which has left us little if any written evidence. In the golden age of Greek history we have evidence of two distinct religious movements of different prehistoric origin. On the one hand, are to be found the beliefs and customs of the earlier conquering invaders of Greece from the north who gave Greece what is called the Olympic religion, familiar to every reader of Homer and of the great Greek dramatists. On the other hand, are to be found the old local cults and customs indigenous to Greek lands for ages preceding.

At one time, the Olympic religion tended to become a national monotheistic and ethical religion; but this tendency was never sufficiently strong to accomplish such a result except in the thought and writings of a few great religious teachers, for the Olympic religion so full of prom-

[1] In this chapter I follow in part Cornford's book "From Religion to Philosophy." His views are questioned by high authority; but speculative and even doubtful as they may be, they are certainly most suggestive and point out a line of study that should be followed. Greek philosophy in its beginnings is an anthropological and sociological as well as a philosophical problem; and therefore the anthropological and sociological point of view from which to inspect its beginnings is unquestionably the correct one.

ise never became completely the religion of the folk. Nevertheless its influence was felt, for it left a permanent impression upon the thought of Greece. The chief moral ideal of this religion was justice and self-restraint and its chief intellectual influence was restraint of superstition and encouragement of a fearless scientific as opposed to a mystical and superstitious conception of nature.

Such, however, was not the tendency of the folk religion, the religion of the ancient local cults. And such was not the tendency of the cult of Dionysus and of Orpheus, which became a powerful intellectual as well as religious influence in Greece during the seventh and sixth centuries before Christ. The Orphic religion is essentially otherworldly. It centers man's interest upon the fate of his soul in a future life rather than upon his social and physical betterment in this world. In its extreme and highly developed form it is the religion of the ascetic and the mystic. In its cruder form it is the religion of dependence upon magical rites and initiations to control the destiny of man's soul, believed to be of heavenly origin, to have fallen and to be now making the round of the wheel of fortune. The soul has come from heaven to earth. After death it may be incarnated in lower animals, it may go to hades and finally it may find its way back to heaven. That is to say, the soul's true home is not on earth but in heaven. Therefore, the soul has fallen and has a fallen or corrupt nature. It has become defiled with the flesh and the business of religion is to purify, to redeem and to rescue the soul. In the long run the influence of this religion became fatal to science and to human enlightenment, for under its influence the direction of least resistance was toward complete reliance upon magic and ritual or upon hypnotism and asceticism, rather than upon the intellectual and social control by man of his own destiny. Such a religion does lead to a certain gentleness, humility

and brotherly love; but it discourages the great enterprises of civilization. It reconciles man to the decadence of civilization instead of filling him with the enthusiasm and energy requisite for social and economic progress and for political co-operation and self-government.

2. Greek theology.—In the highly civilized and enlightened communities[1] the beliefs and customs of more primitive days tended to suggest explicit problems and theories regarding the world and human life. Thus arose explicit bodies of doctrine that may be called theologies. These theologies developed from the primitive customs and beliefs but they never outgrew, even in the minds of the greatest Greek thinkers, the typical forms foreordained by their lowly parentage. And of course the two great religious tendencies originated and controlled two distinct lines of thought.

The Olympic tendency can be best exemplified for us in the cosmogony of Hesiod. Behind and supreme above the gods is Fate (Moira) which divides the world into fixed provinces, (a) the fiery heaven, the sky, (b) the earth, (c) the air, usually called night and regarded as dark and (d) the sea (water). Here two points should be noted. First, these four provinces are evidently the visible universe in its four observable strata, the bright heaven of the sun and stars above, immediately below it the region of air and night's darkness, then the water of stream, river and ocean and beneath all the earth. That is, we have here the most noticeable features of the world, the perceivable features. Second, this division of the world into four observable strata remains throughout Greek thought the chief feature of the universe. It forms one source of the typical Greek theories of the world and it may be the

[1] Such as the more prosperous and progressive city-states of Ionia, and Magna Græcia from the eighth century on and those of continental Greece from the fifth century on.

source of the four elements, earth, air, fire and water, which remain the elemental substances for later times even to the days of modern Europe.

The other, or mystic religious tendency also had its theory of the world. Here the thought was not the division of the universe *spatially* into compartments or provinces but *temporally* into a succession of stages. The soul makes its round from the dead to the living and back again to the dead. There is the seasonal round from summer to winter and from winter to summer. There is the round of the heavenly bodies and especially of the moon with its waxing and waning. In such a religion the important objects of attention are the fate of the soul, the round of the seasons, and the revolution of the heavenly bodies. Time is the father of all things. "God, as the ancient doctrine also has it, containing the beginning, the end and middle of all things that are, moves straight upon his revolving journey in the course of Nature. And always attendant upon him is *Dike*, the avenger of all negligence of the divine law, after whom follows closely, in orderly and humble fashion, whosoever desires that it shall be well with him." [1] Here we have the central thought of the Orphic religion. Besides this, two subordinate Orphic beliefs were of great philosophical importance, first, the heavenly origin, the fall and the redemption of the soul, and, second, the divine circle of all existence, the course from world origin to world destruction and round again to a new world origin.

3. The influence of Greek theology upon Greek science.—Venturesome it is, with the small amount of evidence at our command, to emphasize and to describe the influence of Greek theology upon Greek science; but it is more venturesome to think of the first scientists as scientists in the modern sense. It would have been a psychological

[1] Quoted by Cornford from Plato's Laws.

miracle had the Greek thinkers approached their problems with minds universally open or open to more than a few of the matters heretofore unobserved or if observed, already interpreted by custom and religion. Indeed what little we know of their doctrines proves that their openness of mind was at first narrowly limited. Moreover, one of the most important aspects of Greek philosophy is that it began and remained to the end *a religious philosophy*. It was always *a theory or way of life*, as well as a theory of nature and of man; and it endeavored to do for the cultured man in a nobler way what religion was doing in a less noble way for the people.

One hypothesis points out two distinct currents running through the entire development of Greek philosophy and explains this as due to the influence of the Olympic and Orphic religions. In the first century of science, in the East and especially in Ionia, we find the influence of the Olympic religion stronger; whereas the Orphic religion is found to be the stronger in the West, that is, in Magna Græciâ. And Greek philosophy never completely breaks away from this early religious influence, but remains to the end two philosophies.

4. The two currents in Greek philosophy.—As both philosophies become more scientific they become atomic theories of the universe. The Ionic, or eastern philosophy in so doing consistently carries its atomism over to the theory of the soul and ends a consistent atomistic and mechanistic materialism. That is to say, everything whatsoever is a complex of atoms moving in empty space; the animism of old is virtually discarded and all the processes of nature and of mind are reduced to the motion of atoms; at death the soul disintegrates, and its atoms are scattered; there is no God, or providence, but everything happens from world creation to world destruction by mechanical necessity. As a theory of life it bids man to center

his interests entirely on this world and his earthly welfare and to discard as superstition the religion of the folk and of antiquity. Its logical goal is thus the philosophy we have already called naturalism, the philosophy of the hard-headed non-religious scientist, the philosophy according to which man's soul is to be purified by being freed from superstition.

The Pythagorean, or western philosophy in becoming scientific remains largely religious. In its golden age, however, it makes greater contributions to scientific knowledge than does the eastern philosophy, especially to mathematics and astronomy and to biology. It retains throughout its interest in man's soul and his immortal destiny. Philosophy is also its means of soul purification, but this is done by freeing the mind of mundane interests and passions and by teaching the mind to contemplate the eternal and divine laws ruling, unseen by the ignorant, behind the world of sense. Its logical goal is thus a mystical philosophical contemplation of and preparation for another world, the soul's true home, and the mystic contemplation of the divine reason, or God in and behind all things. This western philosophy also in its best days tends to free man from his gross superstitions though in so doing it holds fast to some of man's oldest beliefs. *Thus the two philosophies stand opposed, the eastern, hard-headed and naturalistic, the western, mystic, tender-minded and romantic.*

For more extensive study read:

Cornford, F. M., From Religion to Philosophy, 1912.
Eisler, R., Weltenmantel und Himmelszelt, 1910.

5. Intellectualistic naturalism and romanticism have remained rivals throughout the history of European philosophy.—That these two tendencies, the scientific and the mystic, the intellectual and the emotional, the naturalistic and the romantic, were present even in the

earliest days of European science is a matter of great interest; for these two tendencies have remained rivals throughout the development of European philosophy. During the sixth and fifth centuries before Christ the scientific and naturalistic philosophy of Ionia hold the leadership; but from the fifth century on through the Hellenistic and Roman periods and on through the middle ages mysticism and romanticism form the dominant European philosophy. With the sixteenth century naturalism and intellectualism once again control the mind of man philosophically; and finally in the nineteenth century romanticism again appears as their rival. Thus from the days of the sixth century before Christ to our own the two philosophies have contended. In the great eras of progress, the golden ages, intellectualism has been the leader; but in the ages of decadence and transition romanticism and mysticism have been dominant.

CHAPTER IX

THE EARLY PERIOD

1. Introductory.—To understand the scientific tendencies of any age we must be informed regarding two matters: first, the doctrines and interests, or intellectual habits socially inherited from the preceding generation; and second, the facts or problems unnoticed by the preceding generation to which the new age attends and by so doing outgrows in part inherited beliefs or interests.

Let us examine first the intellectual habits which the early Greek thinkers *socially inherited.* In general, the Greek scientists of the sixth and following centuries *inherited* a goodly amount of primitive beliefs and customs, magic, animism and myth. In particular, they inherited, as we have seen according to one hypothesis, two different religious traditions regarding man's life and the world which forms his environment; first, the Olympic religion favoring, as history later proved, a more rigorously scientific development; and second, the mystic religion of Dionysus and Orpheus favoring a more religious and less scientific trend.

Whether this particular hypothesis be true or not, *Greek philosophy certainly grew out of the older religion.* Indeed the major problem of Greek philosophic thought throughout all periods was both *cosmological* and *religious;* that is to say, it was a religious as well as a scientific theory of the world. "To anyone who has tried to live in sympathy with the Greek philosophers, the suggestion that they were 'intellectualists' must seem ludicrous.

On the contrary, Greek philosophy is based on the faith that reality is divine, and that the one thing needful is for the soul which is akin to the divine, to enter into communion with it. It was in truth an effort to satisfy what we call the religious instinct. Ancient religion was a somewhat external thing, and made little appeal to this except in the 'mysteries,' and even the mysteries were apt to become external, and were peculiarly liable to corruption. We shall see again and again that philosophy sought to do for men what the mysteries could only do in part, and that it therefore includes most of what we should now call religion.

"Nor was this religion a quietist or purely contemplative one, at least in its best days. The mysteries had undertaken to regulate men's lives, and philosophy had to do the same. Almost from the beginning it was regarded as a life. It was no self-centered pursuit of personal holiness either. The man who believed he had seen the vision of reality felt bound to communicate it, sometimes to a circle of disciples, sometimes to the whole human race. The missionary spirit was strong from the first. The philosopher believed that it was only through the knowledge of reality that men could learn their own place in the world, and so fit themselves to be fellow-workers with God, and believing this he could not rest till he had spread the knowledge of it to others. The death of Socrates was that of a martyr, and 'intellectualism,' if there is such a thing, can have no martyrs." [1]

Besides being religious by virtue of social inheritance, the major problem of Greek philosophy was also cosmological; for Greek philosophy began and remained a theory of the universe. To us moderns "a theory of the universe" sounds extremely ambitious; and that it does to us and did not to the Greeks is important, and is to be explained by

[1] Burnet, Greek Philosophy, 2d ed., Part I, p. 12.

the fact that what the Greeks meant by the universe and what the modern means, are two quite different systems. We mean the vast systems of suns and their planets throughout infinite space, a world with no center, no absolute up or down, a world in which the earth is a mere infinitesimal particle, in short, the world of modern astronomy. They meant the visible universe of the naïve man or of the child, the world whose top is the blue sky and whose bottom is the earth, the world that you and I live in most of the time when we are not astronomically reflective. Let us call it the universe of ordinary perception. The Greeks at first knew of no other universe, for they first of all men outgrew this universe themselves and later taught other men to outgrow it. Thus we should not be astonished that long before science began, men had explained this universe of sense perception in their myths; that the Greek scientists had to start with these myths before they could outgrow them; and that in outgrowing them they still kept to the problem: What is the world that we perceive about us and how came it to be?

I have just said, the Greeks outgrew this universe of sense perception, but in truth they never outgrew it completely; for to the end of the Greco-Roman period and even till modern times this universe remained essentially not only the world of the child but also the world of the sage. In fact, not until the seventeenth century did European science completely outgrow this world of man's childhood. Now the fact that the *earliest* Greek scientists lived and thought within this comfortably small world of primitive thought has interesting consequences; for it implies the complete absence of a vast amount of information which we have since acquired and which we now, because of social inheritance, take as a matter of course. We moderns who are so thoroughly habituated to the world of modern astronomy can only with difficulty pic-

ture and appreciate the necessary blindness of those who did not inherit what to us is thoroughly commonplace. However, if we are to understand this blindness we must try to imagine how the world would appear to us were we quite ignorant of what astronomy and physical science teach and were we dependent *solely upon sense perception* [1] for our information.

(*a*) The sky would seem to be a blue material something not very far distant. Or the sky and earth would seem to be respectively the lid and bottom of a sort of box.

(*b*) This fact would make us associate stars, sun, moon, lightning, sky, clouds, and rain; for they all would seem to us to belong to the same realm, to be neighbors. That is, meteorology and astronomy would form for us *one* science.

(*c*) Night and darkness would not seem to be merely the absence of light and in particular of sunlight but to be a cloudlike or foglike material entity.

(*d*) It would not be evident that daylight comes entirely from the sun. Rather it would seem to come largely from the bright luminous sky.

(*e*) The heavenly bodies would certainly not seem to us what they now do as a result of our schooling. They would seem rather to be small, and not extremely distant, fire or fiery objects. And of course they would seem to move from east to west, and the earth would seem to be at rest. Lightning too would seem to be fire and to be closely related to the other heavenly fires, the sun and stars.

(*f*) Further, it would not be evident what became of the sun at night or what became of the stars by day; or what

[1] Not that the Greeks or any other men have ever been dependent solely upon mere sense perception, for this, we have seen, no one can be; but that mere sense perception is the chief source of information if we leave out of account *for the moment* the socially inherited beliefs.

became of the sun or moon in an eclipse or during cloudy weather.

(*g*) Indeed, the heavens of the day and the heavens of the night might seem two radically different entities.

(*h*) Comets and volcanoes would of course be quite misunderstood by us.

(*i*) What we know as air would not be known to exist. Wind and breath of course would be observed. However, they would not seem to be currents of air but each a distinct, though nearly intangible, entity as is a vapor or a flame. Fire or flame would seem to us to be a material entity, a thing in the sense that a cloud is. As we watched a bonfire, the fire would often seem to us to pass directly into smoke, and as we watched the burning sticks it would often seem as though they "melted" into fire. That is, wood seems to become fire, and fire smoke, precisely as ice seems to become water and water seems to become vapor.

(*j*) It would not be evident to us whence is formed the rain, whence comes the water in springs, whence arises the silt and sands deposited at a river's mouth or along its course, or what becomes of the rain water as it disappears from the ground's surface.

(*k*) The true size and shape of the earth would not be apparent. Rather the earth would seem flat and we should be in doubt about its extent. Moreover, the earth would seem the very bottom of the universe.

(*l*) The origin of many plants and animals would not be known to us. Some would seem to spring directly from the mud or from the water of the sea. Their decay would seem literally a return to the earth or to the water whence they sprang.

(*m*) Many things, such as vapor, fire, cloud, smoke, and even lower forms of life, would seem to come out of nothing and to pass away into nothing, as to the ignorant odors and sounds seem to do.

This list by no means exhausts the differences between the world as we picture it and the world as it might be pictured by us if our information were limited to what is revealed directly through sense perception; but it does at least suggest the magnitude of the difference. These particular naïve and primitive beliefs have been chosen because there is evidence that the Greek scientists inherited them and had to outgrow them.

Besides knowing what habits of thought the Greek scientist inherited and besides noticing his lack of many of our socially inherited habits of thought, we must enquire also, if we would understand early Greek science, what were the new factors which led the intellectual leaders of that time to advance beyond the naïve and primitive beliefs of their fathers. The general factors in this great intellectual awakening have been mentioned already. These factors were: the establishment of Greek colonies throughout the Mediterranean world with their influence upon thought and custom, and in particular upon geographical knowledge; the increase in wealth, leisure and refinement in parts of the Greek world; the closer contact through trade, travel, commercial rivalry and geographical juxtaposition with the civilizations and with the peoples of Egypt, of Phœnicia and of Persia; and finally the changing political and social conditions and the increase of individual freedom and initiative within the Greek world itself as the wealth and the population grew. These several factors are especially prominent in Ionia and in the Greek colonies of southern Italy and Sicily, where science had its beginning.

The special factors we have yet to mention, but unfortunately regarding most of these we are ignorant. However, we do know that in these days some Greeks began to wonder about the motion of the sun, moon and stars, the phases of the moon and the eclipses, about the changes of

season, weather and climate, about the cause of day and night, about the shape and location of island, continent and sea, about sickness and death, and about certain simple arithmetical and geometrical truths. Moreover, we know that the Egyptians, the Persians and the other near neighbors of the Greeks could arouse among the Greeks interest in some of these matters; for they had much simple empirical information regarding the heavenly bodies, their motions and periods and regarding elementary mathematical relations. Finally, we may infer that the many and distant voyages of Greek sailors often aroused an interest in geography, climate and the phenomena of the heavens. But whatever the special stimuli may have been, when the Greeks once commenced to enquire into these few subjects, they were led on rapidly to interest themselves in others, and within two centuries the field of their enquiry had become widely extended. In breadth of interest and study the only epoch in all of human history comparable to this of the Greeks is that composed of the past five centuries in western Europe.

2. The important discoveries known to have been made in the early period of Greek science.[1]—Of the be-

[1] The most prominent thinkers in the early period of Greek philosophy are the following. The eastern tradition: Thales of Miletus (*floruit circa* 585 B. C.); Anaximander of Miletus (*fl. c.* 570 B. C.); Anaximenes of Miletus (*fl. c.* 540 B. C.); Heraclcitus of Ephesus (influenced also by western thought) (*fl. c.* 495 B. C.). The western tradition: Pythagoras of Samos, later of Southern Italy (*fl. c.* 525 B. C.) and his followers. The latter divided into two schools, the Pythagoreans and the Eleatics. Of the Pythagoreans (of whom few names have come down to us) should be mentioned Philolaus of Tarentum or Crotona (*fl. c.* 440 B. C.) and Archytas of Tarentum (*fl. c.* 430 B. C.). Of the Eleatics the most noted names are: Parmenides of Elea (*fl. c.* 475 B. C.); Zeno of Elea (*fl. c.* 450); and Melissus of Samos (*fl. c.* 440). Related to both eastern and western traditions and especially to Eleatic thought were: Xenophanes of Colophon, later of southern Italy (*fl. c.* 530 B. C.); Empedocles of Sicily (*fl. c.*

ginning of the modern, or Atlantic period we have ample records from which we know it to have been a period of great and numerous discoveries, a period that was adventurous and experimental in its thought and research and in its many other enterprises. Now little as we know of the details of the first century of Greek science, we have enough evidence to infer that it was a similar period, that it also was an age of discovery. In short, like the beginning of the modern period this century also was a period of geographical, astronomical, mathematical, physical, and physiological discovery.

I have already mentioned the great advance in geographical knowledge brought about by the spread of Greek colonies and commerce. In general, geographical *science* began in this period. In particular, we hear of the deliberate attempt to ascertain latitudes [1] and for the first time in history to construct maps [2] and to write books that can be called geographical. Of course, compared with our modern geographical information, the information of these Greek thinkers remained meagre and much that they believed was erroneous. *But here as elsewhere their great achievement was that they made a beginning.*

In astronomy too the first genuinely scientific beginnings belong to this period. Instead of the primitive beliefs men were for the first time entertaining such thoughts as these: that the earth is not an absolute bottom to the world but rests suspended in space,[3] supported possibly by water or by the air; that the earth moves; and even that the earth swings free in space and is of spherical shape. They dis-

455 B. C.); Anaxagoras of Asia Minor and later of Athens (*fl. c.* 460 B. C.); and finally the atomist, Leucippus of Abdera (*fl. c.* 460 B. C.).

[1] By an instrument called the gnomon which the Greeks seem to have imported from Asia.

[2] Anaximander and (possibly) Hecateus of Miletus (*fl. c.* 495).

[3] Which makes it possible for the sun to go beneath it at night from west back to east.

covered that the moon shines by reflected light and that it is spherical. They discovered the true causes of lunar and solar eclipses. They entertained the thought that the heavenly luminaries are bodies and that they are immensely bigger than they appear. Finally, some thinkers became convinced that the earth itself is one of the planets and that it moves in an orbit about a central fire.[1] In the realm of physics they discovered that the space immediately about us is not mere emptiness but is filled with air and that darkness is an absence of light rather than a positive thing.

Notice in these few illustrations two important stages of philosophical growth. First, many ancient and tenacious beliefs and crude superstitions were explicitly contradicted. Second, intellectual leaders were thinking their way beyond what is actually perceived by sense, entertaining even theories that must have seemed to their fellow citizens *to defy not only all tradition but man's very eyesight.*

The progress of this period was great also in the field of pure thought, especially in logic and in mathematics. For the first time known to us in history men endeavored deliberately and explicitly to demonstrate hypotheses and to refute the contradictory hypotheses,[2] with the result that argumentation or logical discourse began itself to receive notice and to become an explicit problem. When demonstration became thus the object of study, the science of logic was born. Mathematics also was born in this period and developed rapidly. Tradition assigns its beginnings to the earliest Ionian philosophers, but its most

[1] The Pythagoreans. This central fire was not the sun. The sun itself was believed to be a planet shining by reflected light from this central fire. Unfortunately this view did not become the accepted hypothesis of Greek astronomy.

[2] *E. g.*, Parmenides and Zeno.

marked progress took place in Italy and was due in particular to the Pythagoreans. Several important elementary properties of numbers [1] were noticed, and many elementary theorems in plane geometry [2] were discovered and demonstrated. The elements of harmonics also were studied.

Finally, we have evidence that the science of human anatomy and physiology had begun. This evidence is to be found not only in the masterful knowledge and keenness of observation of human anatomy shown in Greek art but also in such discoveries as the flux and reflux of the blood between the heart and the surface of the body,[3] and in medical writings that have come down to us in which primitive religious medical beliefs are explicitly rejected.[4] Though we know but little regarding the meth-

[1] Such as the incommensurability of some lines in terms of the integers, *e. g.*, the hypotenuse of a right-angled triangle whose other two sides each equal unity. This seems to have been the first step toward the discovery of irrational numbers (*e. g.*, $\sqrt{2}$). Again, such as some properties of the continuum. Zeno proved by immortal arguments that if the only numbers are the natural series of integers, our ordinary judgments regarding moving bodies lead to absurdities. At his time no other view of number had been entertained. "Even rational fractions are unknown to Greek mathematics, and what we treat as such are expressed as ratios of one integer to another. Still harder was it for the Greeks to regard a surd, for instance, as a number, and it was only in the Academy that an effort was made at a later date to take a larger view." In short, Zeno proved "that there must be more points on the line, more moments in the shortest lapse of time, than there are members of the series of natural numbers." (Burnet, Greek Philosophy, 2d ed., Part I, p. 85.)

[2] Such as, "The square of the hypotenuse of a right-angled triangle equals the sum of the squares of the other two sides."

[3] Known to Empedocles.

[4] "The true spirit of Ionic science is best seen in some of the writings ascribed to Hippocrates, which are certainly not later than the fifth century B. C. In the treatise on *The Sacred Disease* (epilepsy) we read—

"'I do not think that any disease is more divine or more sacred than

ods of research used in this period, the records of the few which have come down to us show them to have been of a genuinely scientific and painstaking character.

3. The Eastern, or Ionic philosophical tradition.—Let us now follow the two chief courses of early philosophical development, the eastern, or Ionic and the western, or Italic. Not that either tradition was isolated; on the contrary they mutually influenced each other. In the earlier days of the period especially, the East influenced the West; and in the later days especially, the West influenced the East.

Inheriting from religion, it may be, the thought of an ultimate power (Fate) dividing the world and keeping it divided into four great realms, the fiery heaven, the dark air or vapor, the ocean and earth, the eastern thinkers [1] became interested in the following problems: What rules these four realms of the world? What is their nature [2] or stuff? May not some one of them be the ultimate

others—I think that those who first called this disease sacred were men such as there are still at the present day, magicians and purifiers and charlatans and impostors. They made use of the godhead to cloak and cover their own incapacity.' And again in the treatise on *Airs, Waters and Sites*—'Nothing is more divine or more human than anything else, but all things are alike and all divine.'" (Burnet, Greek Philosophy, 2d ed., Part I, p. 32 f.)

[1] In later days strongly influenced, it is true, by the thought of western thinkers.

[2] The Greek word is *physis* which was translated into Latin by the word *natura*, whence our English word nature. This term has had a long and varied history. "We seem able to distinguish two main heads under which its shifting senses may be grouped: the static and the dynamic. Statically conceived, Nature means the system of all phenomena in time and space, the total of all existing things; and the 'nature' of a thing is its constitution, structure, essence. But it has never lost its other, dynamic, side—the connotation of force, of primordial, active, upspringing energy—a sense which, as its derivation shows, is original" (Cornford). Both meanings lurk in the question stated in the text.

stuff or *physis* and may not the others then arise out of it? How do the individual things we behold about us arise out of these more nearly ultimate kinds of entity, water, vapor and fire; for some things (such as an animal's body) seem to be composed of earth, water, breath and fire? In answering these questions two postulates or principles seem especially to have controlled their thought: *Out of nothing, nothing comes;* and *no thing can really be annihilated.* That is to say, an animal's body does not arise out of nothing, for all the stuff of which it is composed existed beforehand; and the dead, decaying body does not pass into nothing, for the earth, air, water, fire, or stuffs of which it is composed, continue to exist, returning to the realms where they belong. Again, when wood is burning the fire does not come from nothing nor does the wood pass away. The fire must all along have been in the wood and after the wood has disappeared we must believe that the fire, smoke and ashes account fully for the stuff of which it was composed. The fire returns (going upward) to the realm (the heavens) where it belongs, the smoke goes to the realm of dark air where it belongs, and finally the ashes remain on the ground (the earth) where they belong. Thus (as we should say) there is a tendency for the four great realms of existence to maintain themselves distinct and in equilibrium. The individual things (*e. g.*, the wood) constitute an unstable equilibrium precisely because they are of many stuffs belonging to realms to which they tend to return. Hence the relatively short duration of all (individual) things. They are disturbances in the original equilibrium foreordained by the ultimate law or ruler of the world.[1] Starting with these problems

[1] "And into that from which things take their rise they pass away once more, 'as is ordained; for they make reparation and satisfaction to one another for their injustice according to the appointed time,' as he (Anaximander) says in these somewhat poetical terms." (A

and principles the eastern science led the way, influencing and in turn influenced by the western science, until it reached its goal, the atomic theory of Leucippus.

4. The western, or Italic philosophical tradition.—The western thinkers were early divided into two distinct schools, the Pythagoreans [1] and the Eleatics; [2] and though these two schools had some traits in common, their influence upon later thought was sufficiently diverse for us to keep them quite apart in our study. Though both western traditions also led toward atomism, their total scientific influence was unlike that of the Ionic tradition. In the beginning their leaders were directly under the influence of Ionian cosmologists and later they in turn influenced the eastern tradition and helped greatly to lead that tradition to atomism. Moreover, the Pythagoreans developed their own atomism, an atomism according to which the ultimate differences between the atomic entities are those obtaining between the regular geometrical solids, as the tetrahedron or the dodecahedron, and in which discoveries regarding the comparative length of musical strings also played a part. In contrast to the Pythagoreans the Eleatics tended to reject the possibility of science; and though they influenced science powerfully through their

surviving fragment of the Greek tradition of Anaximander's doctrines, translated by Burnet.)

[1] Pythagoras and his followers. The school survived for centuries.

[2] Parmenides of Elea in Italy, a seceder from the Pythagorean school and a severe critic of all early cosmology, and his followers. The Eleatic school lasted well on into the fourth century. The word school here used deserves notice. Precisely as the religious priesthoods and similar societies, found so often in the earlier days of civilization, formed clubs or fraternities; so also did the first groups of scientists, the cosmologists and the physicians. Of these the Pythagorean society stands out as a marked instance not only as a secret society but also as a fraternal and almost monastic order. Even to the end of the ancient, or Greco-Roman period this tendency of the thinkers or scientists to form schools or societies persisted.

keen criticism, they themselves tended more and more toward mere mysticism. Let us study each of these traditions in turn.

The Pythagorean tradition remained unlike the eastern tradition in four important respects.[1] First its members tended to be mystics of the Apollonian and of the Orphic types; whereas most eastern thinkers were distinctly secular.[2] This mysticism made them interested in the purification of the soul and the problems of its origin, nature and destiny. It made them also the authors of the belief that was to play so important a part in the spiritual life of Greece, the belief that the study of music and mathematics or in general of philosophy purifies the soul. Finally, it made them the authors of the first and most famous arguments for the soul's immortality; and it made them the first psychologists. The second important respect in which the Pythagorean differed from the eastern thinker is his keener interest in the study of numbers and geometrical figures. The third respect is the emphasis placed upon *form* as opposed to *matter* as the object of scientific study. This problem of form is the obscure beginning of an interest in what the modern calls the mathematical laws of nature as opposed to the cruder interest of the Ionian cosmologist merely in the stuff of which things are composed. Strange to say, the interest began in the study of the ratios between the length of strings sounding the seven or eight notes of the Greek musical scale. The Greek word for form is *idea* and this doctrine regarding forms, or ideas is the earlier stage of the famous

[1] In the first of these respects it is closer to the Eleatic tradition.

[2] This statement should be qualified with the further statements that there was a small division of these thinkers, some later Pythagoreans, who were distinctly secular and that some of the western leaders, as Xenophanes, bitterly attacked the anthropomorphic polytheism of Homer and Hesiod and taught a pantheism, maintaining there is but one god, the world.

doctrine of ideas of Socrates and Plato to be studied best as it appears in the Athenian period. The fourth respect in which the Pythagorean differed from the early eastern thinker is his interest in astronomy and medicine. The eastern thinkers even in the days of atomism held to decidedly cruder astronomical hypotheses; whereas, as we shall learn, the Pythagoreans are the ancestors of the Copernican hypothesis. In medicine too the true beginnings seem to have been in the West and the later famous medical tradition of the East was of western origin.

Though the Pythagorean school contributed more to the beginnings of the special sciences in Greece than did the early eastern schools, yet in the long run its mysticism was the enduring *philosophical* influence it exerted upon Greek thought. This mysticism, we have seen, centered about the ancient Orphic doctrine of the soul, its origin and destiny. The soul is of heavenly origin. It lived before this life as it will live after this life. Hence it is not intimately related to the body. Rather the body is its prison or is a suit of clothing which it outlasts and discards at death. It is not essential to the life of the soul even that the soul should have a body. Rather in the heavenly life of the soul, its best life, it is free from the burden of the body and from the body's limitations. What we call birth is the true death and what we call death is the true birth. Since sin (or some mysterious catastrophe) caused the soul to fall from its original blissful state and to become incarnate and defiled by the flesh; man's greatest enterprise is to find the way back to heaven, the true home of the soul. Hence by purification, by overcoming the flesh, the way is made back to heaven. In its crudest forms this purification was merely a matter of initiations and magical sacraments, but in its noblest forms it was spiritualized and rationalized. The true life of the soul is to be free of the flesh and of all fleshly lusts and interests, in other

words, to be holy and to be intellectual. Hence the true purification is to overcome all worldly interests and to become absorbed in the contemplation of God, or we may say, in the contemplation of the good, the true and the beautiful. Evidently such a religion is other-worldly. It tends to weaken the individual, the social and the political ambitions of a people, those interests which are requisite to produce the great eras of progressive civilization, such as the Periclean age or modern Europe. However, this is the religious philosophy, which as we shall see in later chapters, became the typical religion of Europe's greatest minds from the days of Plato to modern times.

The other western school of philosophy was the Eleatic. The chief tendency of this tradition was to criticise science and to show that the scientific enterprise is futile. Its criticism of science was extremely keen and important and forced the advocates of science to do some very hard thinking. In this negative way Eleaticism contributed to logic, mathematics and the study of the logical foundations of science and of the nature of science more than any other early Greek philosophy. Indeed we owe to its critique the Greek science of logic which remained the logic of Europe till modern times. However, in a positive way Eleaticism was a scientific nihilism. Its chief doctrine was that "all is one," that scientific analysis is impossible, that science cannot discover any structure in things or in the cosmos, and therefore that science cannot truly explain. If "all is one," all multiplicity and variety, all structure and order are delusions of our senses. As a scientific nihilism Eleaticism tended to drift more and more into a fallacious and carping criticism of science on the one hand and into an empty mysticism and obscurantism on the other hand.[1]

[1] It was reaching this stage in the late Athenian period, in the days of Plato and Aristotle.

For further study read:

Gomperz, T., Greek Thinkers, Vol. I, 80–98, 123–152;
Plato's Phædo;
Tozer, H. F., History of Ancient Geography, 1897, 19–74;
Ball, W. W., Short Account of the History of Mathematics, 1888, 1–30;
Cajori, F., History of Mathematics, 1894, 1–23;
Burnet, J., History of Greek Philosophy, 1914, Part I, 1–101;
Taylor, A. E., Aristotle on His Predecessors, 1907.

For more extensive study read:

Burnet, J., Early Greek Philosophy, 2d ed.;
Cantor, M., Vorlesungen über die Geschichte der Mathematik, 3te. Aufl., 1907, Bd. I;
Tannery, P., Recherches sur l'histoire de l'astronomie ancienne, 1893;
Tannery, P., Pour l'histoire de la science hellène, 1887;
Milhaud, G., Leçons sur les origines de la science grecque, 1893; and Les philosophes-géomètres de la Grèce: Platon et ses Prédécesseurs, 1900.

CHAPTER X

THE ATOMIC THEORY

1. Important stages in the evolution of early cosmology toward atomism: (a) The general theory of transformation.—From the beginning of Greek science, as we have seen, the eastern philosophers tended to believe that all things in heaven and earth are transformations of some one thing, or primitive stuff, and that this stuff is either water, vapor or fire. Of the more primitive cosmologies one that well illustrates this belief in transformation is the cosmology of Heracleitus.[1] In one quite simple theory Heracleitus offers an explanation of the entire perceptible world, that is to say, of the sky, the stars, the moon, the motions of these heavenly fires, the lightning, the clouds and rain, night and day, summer and winter, the earth and its inhabitants. He includes even an explanation of sleep, death, and alcoholic intoxication. His theory has four chief assumptions. First, the primary stuff is fire. Second, fire to exist has to be fed and as it burns it gives off smoke or smoke-like stuff, that is to say, all things in transforming have to be fed at one side as they give off the new stuff at the other side. Third, there is, as it were, a circle of stuff-transformation, from fire back to fire: to wit, fire produces smoke-like things (storm-cloud, darkness, etc.); these produce water; water produces earth-like things; these again produce water; water pro-

[1] I give his theory very briefly and only in as far as it illustrates the preceding statement. He was really a reactionary and represents a view that had already been outgrown by some of his contemporaries.

duces vapor; and vapor produces fire. Thus the circle is complete. Fourth, the mental is fire.

With these four assumptions all things in heaven and earth can be explained. On the one hand, there is "the path upward," the earth transforms into water (the ocean), the water (the ocean) transforms into the bright vapor, the vapor transforms into the fire (the bright sky and heavenly bodies). As these burn they give rise to storm-cloud and darkness (night). Hence comes the water (rain and ocean) and hence in turn the earth. The balance of things is kept up by these transformations being equal. That is, as the earth gives up water it is fed in exchange by water. As the sun gives up darkness and cloud it is fed in exchange by vapor. But this balance is not kept up quite perfectly in the twenty-four hours, or in the year, or in the course of centuries. The result is, the sun gives up so much darkness that it gets extinguished (night). The night (darkness) failing to be fed as it is in the day-time by the heavenly fires, gives up more than it receives and so becomes extinguished in turn. Hence comes the day (fire). Winter similarly results from a lowering of the amount of heavenly fire and summer from a corresponding excess of heavenly fire. Finally, in the course of ages there is a similar but far greater excess of the fiery stuff which means world conflagration to be succeeded by a corresponding shortness of fire, the birth of a new world. So nature goes on in cycles. It is all one, an eternal fire and its transformation. The world is ceaselessly changing but none the less balanced in its changes. [1]

If we keep in mind the points made in the preceding chapter regarding the limited information of the first cosmologists, especially the appearances of the world to primitive perception, and the seeming simplicity of things

[1] I omit his explanation of eclipses and of the phases of the moon. Notice that we have by his theory a new sun every day.

when man is still ignorant of their complexity, we shall find in such a theory as this of Heracleitus the master work of a genius. [1] Given only the data of ordinary perception, his explanation was nearly adequate. But it could not long remain adequate for even in his own day new data had been added by more careful and extensive observation; and even with his data his theory was not quite adequate, for it offered no solution of the problem: How can one stuff transform into another? Let us turn to this latter problem and consider the brilliant solution of it finally reached by early Greek philosophy.

In the most primitive cosmologies this question: How can one thing transform itself into another? did not trouble the thinker. Possibly a vitalistic or animistic way of regarding such events not only sufficed but was assumed as a matter of course. That is, things are more or less alive, and as such, of course, they change and give birth. But we have ample evidence that this question soon became paramount. The first clear cut progress was the hypothesis that transformation is but *rarefaction and condensation.*[2] Notice what such an hypothesis implies. It implies that what appears to be a qualitative change (*e. g.*, water becoming fire) is really a quantitative change (*e. g.*, water is merely condensed fire and fire rarefied water). But the first conception of rarefaction and condensation probably remained quite crude and naïve for the cosmologist seems not to have enquired further into the nature of this transformation. Soon however this enquiry was made with an astonishing but consistent outcome. Rarefaction and condensation presuppose particles and empty spaces between these particles. That is, condensation is a denser

[1] Or should so find, were it not for the fact that other thinkers in his own day had already outgrown such primitive cosmologies and that Heracleitus was therefore a reactionary.

[2] Anaximenes.

or closer packing of discrete entities, and rarefaction is the separation of such entities increasing the size of the intervening spaces.

Now this hypothesis introduces a question whose final answer even modern science has not yet given. Are we to think of each of these intervening spaces as an absolute vacuum or is every space full? In other words, is matter a collection of ultimately discrete entities or is it one infinite continuum? [1] The first answer to this question was offered by a western Greek thinker.[2] He found an absolute vacuum or empty space an absurdity. Empty space is nothing, and nothing cannot exist or be real. It cannot be even thought. The world then must be one solid continuous mass or *plenum*.[3]

A further conclusion was drawn also by him and his followers, the Eleatics. There can be no motion and no change [4] for both presuppose empty space. This conclusion is of course paradoxical but it was thoroughly logical, granted motion and change as conceived in those days. [5] And of course it follows as a corollary that the world is uncreated and indestructible, for if it was created it must have come from nothing. "And if it came from nothing, what need could have made it arise later rather than sooner?" Finally, that which exists is not "divisible,

[1] In the words of modern physics, are the ultimate entities of the physical world discrete or is there one universal continuous ether and are these so-called discrete entities but points, let us say, of stress in the ether?

[2] Parmenides.

[3] By Parmenides thought to be a finite sphere. By Melissus thought to be spatially infinite.

[4] Especially evident if we explain change as due to rarefaction and condensation.

[5] I say "as conceived in those days," for we moderns can conceive of wave motions that can pass through a continuous fluid without displacing the parts of the fluid.

since it is all alike, and there is no more of it in one place than in another, to hinder it from holding together."

But all of this is the *reductio ad absurdum* of the first attempt to explain the world as a continuum. The enterprise of science is not to refuse to admit facts but to explain facts. Now motion and change are facts. If denying the existence of empty space and accepting the doctrine of the continuity of matter we fail to explain these facts, then we must either conceive the nature of continuity in some other way or admit the existence of empty space and the discreteness of matter.[1]

However, the immediate pathway of Greek thought led the cosmologist to keep on assuming the doctrine of continuity. If existence contains no empty space, and if both motion and change are facts, how can we account for these facts? The answer given [2] is: the primitive stuff must be of several kinds. If it were alike throughout and if there were no empty space, change or motion would produce no alteration, would make no difference, and would of course be imperceptible. But, if we assume different types of stuff (*e. g.*, earth, air, fire, water, or hot and cold, and moist and dry stuffs) then change and motion are the rearrangement, the mixture and separation of different amounts of these kinds of stuff.[3]

[1] In general, the latter alternative has been the one chosen by science from those ancient days to our own, but time and again the doctrine of continuity has been reasserted. One very recent reassertion is that made by Sir Oliver Lodge in his presidential address before the British Association. *Science*, 1913, *38*, 379, 417.

[2] By Empedocles and Anaxagoras.

[3] Let us picture it (for illustration) like a dough made by mixing flour, water, milk, sugar and butter. Starting with each separate and stirring them together produces a markedly different thing, the dough. Yet the dough is only a mixture of these kinds of stuff. Moreover, for our perception (if we include in thought also the intervening air) the mixing has not involved empty space. It is only a

To other philosophers [1] the Eleatic doctrine that motion presupposes empty space seemed correct. Accordingly they took a second pathway. Motion takes place, and inasmuch as motion presupposes empty space, empty space exists. That is to say, empty space exists between the parts of the world's stuff and this stuff is therefore discrete. It is not, however, infinitely divisible. Rather we must picture ultimate indivisible parts and hold them to be (true to the Eleatic doctrine) *plena*, that is, both continuous and unchangeable. Here we have finally the atomic doctrine, which teaches us to account for the world's structure, origin and changes, and for the nature of its different contents and their effects upon one another, in an extremely easy way; for it maintains that the ultimate particles, or atoms are *alike* in stuff and are *unlike* only in size and shape, and it endeavors to explain the difference between things (*e. g.*, between fire and ice), and the changes wrought in things (*e. g.*, the melting of ice), merely by the coming together and the separation of these minute changeless particles of different sizes and shapes.

(b) **The origin of motion.**—All the preceding theories either presuppose or deny motion. In the latter case the origin of motion is of course ruled out as no longer a problem, but in the former case it remains a problem of great philosophical importance. Probably at first this problem was ignored, for that things move, was taken as a matter of course. That is to say, why the primitive stuff moves is felt to be no more a problem than why a *living* creature moves. In short, motion is natural to all things and, in this vague sense, the primitive stuff is alive. But when motion is denied or declared to be impossible, the origin of motion can no longer be ignored in this naïve way.

rearrangement in a continuous mass of the different stuffs which compose the mass.

[1] Leucippus, Democritus and their school.

Still, it is interesting to see even then how naïvely the problem is solved. Animism is not given up, but only one step is taken toward giving it up. The usual primitive stuff or body is in itself motionless, but now a new sort of stuff is assumed (in distinction from air, fire, water, etc.), a moving, motion-giving body. This originates motion, this unites, separates or mixes the ultimate bodies and brings about the great cosmic changes and creates our present world order. This motion-giving stuff or body remains evidently animistic. For example, by one philosopher [1] it is called Love and Hate, by another [2] Reason.[3] Finally, with atomism animism is abandoned, for the atomist teaches that the atoms always have been in motion, or at least he deliberately assumes their motion as ultimate and unaccountable.

Whether animistic or not the doctrine of all these early cosmologists regarding motion is a distinct and great advance over primitive thought. *It transfers the motion of things to the primitive or universal stuff.* The blowing of the wind, the storm, the motion of the sun, and a host of other events are no longer the acts of independent living entities but the result of the unceasing activity of the primitive body, and the same is true of the origin and the passing away of each thing. In short, if animism remains, it ceases to hold of the particular things, and holds only of the world at large or of the primitive body.

(c) **Quantity and quality.**—One further and most important feature of the progress in early cosmology should be noticed. If we explain the multitudinous things with their varying qualities by purely quantitative changes in some one or more primary bodies, we are thereby re-

[1] Empedocles.

[2] Anaxagoras.

[3] We find in these stuffs the ancestor of the modern notion of forces or energies.

ducing the number of ultimate qualities. That is to say, all of the qualities were regarded by the earlier cosmologists as mixtures of a few elementary kinds of body or, *we* should say, of a few elementary qualities, such as cold and warm, rare and dense, dark and light, moist and dry. This tendency to reduce qualities to quantitative changes in a few primary qualities reaches its goal in ancient atomism which all but reduces quality completely to quantity. For example, the differences between fire and earth are due to the *size* and to the *shape* of the atoms rather than to some difference in fundamental qualitative stuff. If this tendency had worked its effects out to the logical extreme (as it has in modern mechanics)[1] then the fundamental stuff itself would be quite robbed of quality. The atom would be a mere moving point. Then configuration and motion would be the sole notions in terms of which every question regarding the objects in the world about us would ultimately have to be put.

2. The atomic theory: (a) Its principles.—Let us now sum up briefly the principles reached by early eastern Greek science in the atomic theory of Leucippus. (1) Fate, or an ultimate animistic power ordaining the realms, becomes a superfluous hypothesis. The kinds of stuff will order themselves in the cosmos without external direction, for they will do so by a process that is mechanical. (2) The rising and the passing away of (individual) things are but a coming together and a separation of the elementary stuffs of which they are composed. That is to say, the processes in the world about us are in every case forms of motion, and there is no other form of change. Ultimately whatever is, is; and therefore it cannot change. It can move from place to place, and it can combine with other entities or separate from them. (3) If individual things are formed

[1] In modern mechanics the atom or material particle is merely a moving point, whereas in the ancient atomism, it has size and shape.

by the combining and the separating of elementary stuffs, then these stuffs must be made up of separate parts or particles. In other words, earth, air, fire and water must be granular and so divisible. We should not, however, suppose that they are divisible *ad infinitum*. Rather there must be ultimate indivisible particles, exceeding minute but truly atomic. In short, everything is made up of atoms. (4) If all change is motion, and if all the different kinds of (individual) things are due to the coming together and the separating of elementary atomic stuffs, then the differences between things must be due to the quantity and proportion of their elements. In other words, *quantity* rather than *quality* explains these differences. (5) This leads on to a yet profounder principle. May not all difference, even that between the elementary stuffs, be purely quantitative? For example, may not fire differ from earth merely in the size and shape of its atoms? This hypothesis would explain also the difference in behavior of the various stuffs. For instance, if fire is light and mobile, may this not be because its atoms are small, smooth and round; whereas the atoms of earth are rough, irregular and larger? (6) If the world is but a cloud of atoms in empty space, we must distinguish sharply between the world *as it is*, that is, *as it is known to science* and the world as *it appears* to our *untutored* senses. The world of *science*, the world of *reason*, the *real* world is thus sharply contrasted with the world of *sense*, the world of *appearance*. The real world is a world of elemental stuff and its variety and changes are purely spatial or quantitative. The world of appearance possesses a vast array of different things and their qualities. The real world is mathematical and quantitative. The world of appearance is qualitative and non-mathematical. (7) Finally, it follows that the gods of religion and myth are quite superfluous in accounting for the events of nature. Nature presupposes

no guidance, for what takes place has to take place. *Necessity* rules everywhere.

In short, there exists an infinite empty void called space. In this space are an infinite number of exceeding minute particles of different shape and size. As to stuff or quality they are all alike, for they differ only in size and shape. These particles, or atoms, are in motion in all directions. In colliding with one another they can alter one another's path. Finally, some of these atoms, because of their shape and size, are more mobile than are others (*e. g.*, the atoms of fire). These few principles are sufficient to explain the universe in its infinite variety of object and event! Thus the Greek thinker reached the famous atomic theory, one of the most brilliant achievements of Greek scientific thought.

(b) **The atomic cosmology.**—How lucid and simple the atomic theory of Leucippus was, may be seen from his general cosmology. In the vast stretches of space the atoms are moving in all directions. The larger and more irregular atoms are more liable to collide and hence these atoms are the most retarded, whereas the smallest and roundest are the least liable to be retarded. "In the infinite void in which an infinite number of atoms of countless shapes and sizes are constantly impinging upon one another in all directions, there will be an infinite number of places where a vortex motion is set up by their impact. When this happens, we have the beginning of a world;" [1] and the visible world of which we are inhabitants is one such vortex. The rough and large atoms have been forced to the center and form the solid earth on which we dwell; and the atoms that are more and more smooth and small have been forced to the outside and so form respectively the famous zones of water, vapor and fire, namely, the ocean and rain, the cloud and vapor, the heavenly fire and

[1] Burnet, Greek Philosophy, 2d ed., Part I, p. 98.

the sun, planets and fixed stars. That our world is one of these vortices, explains the motion or revolution of the heavens and the heavenly luminaries. Again since our world is only one of these vortices, there are other worlds than ours; and between these worlds extend vast stretches of comparatively empty space, the *intermundia*.

(c) **The significance of the atomic theory.**—It is important to enquire at once regarding the significance of this atomic theory of early Greek science. A theory can be significant in at least three ways:—(1) by destroying or inhibiting older beliefs; (2) by arousing interest in new problems and by suggesting new methods of investigation; (3) by what it itself enables us to explain correctly. This theory was most significant in destroying old beliefs or, to adopt a much used expression, in "*enlightening*" the cultured Greeks. A thoughtful Greek could hardly believe that the universe is a cloud of atoms moving about in accordance with necessary mechanical laws, and at the same time continue to believe the primitive traditions and superstitions of his people. The worship of the gods and the old magical rites and ceremonies must needs seem to him utterly ineffective and useless, valuable customs no doubt for their purely psychological influence upon the ignorant and unruly masses but of course absurdities for the cultured and disciplined man. Hence no wonder that the spread of this and the preceding cosmological theories would result, in a society such as that of the Greek world in the sixth and fifth centuries B. C., in *a radical enlightenment*. No wonder that their spread was opposed by men of conservative tendencies. In this first respect early Greek science and in particular the atomic theory were of great historical significance.

The atomic theory was of some but of decidedly less significance as a means of arousing new interests and suggesting new methods of research. It suggested prob-

lems in psychology, physiology and medicine, problems in astronomy and physics, and finally problems in morals and politics. But it really failed to suggest fruitful and feasible methods of research.[1] It might perhaps have done this latter, had not the scientific tradition, so brilliantly begun, been inhibited by Greece's political misfortunes. But history records astonishingly little well directed and successful research as the direct outcome of Greek atomism.

Indeed the atomic theory illustrates both the success and the failure of most of Greek science. Greek science enlightened but it seldom really informed. It destroyed old beliefs, it aroused many new interests, but it seldom led to the correct or final solution of special problems. That is to say, the atomic theory was an instance of brilliant speculation; but it did not and it could not take the place of discoveries of fact or solutions of special problems. Such discoveries and solutions, and such alone, could make the atomic theory an important instrument of research; but they were not to come till the days of modern civilization, till the great modern age of astronomical, physical, physiological and chemical discovery.[2]

But what is the significance of the ancient atomic theory as a permanent contribution to European thought? To answer this question justly and correctly is difficult for two reasons. On the one hand, atomic theories have been most fruitful in modern physical science; [3] but on the other

[1] Perhaps the lost Democritic writings would show us that this was not the case. There is some tradition of experiments that form a beginning of chemistry, and chemistry is, of course, one of the true lines of progress beyond Ionic philosophy.

[2] This is not to be interpreted to imply that the Greeks did not make numerous special discoveries, for as we have seen they did make them. It means that they failed to make, for example, such discoveries as the chemical elements which would at once verify the atomic theory and make it useful in further research.

[3] Especially in mechanics and in chemistry.

hand, even we moderns are not in a position from which we can see the destiny of the atomic mechanistic theory as a general world hypothesis. Even with our wealth of physical information we cannot yet explain *by a rigorous atomistic mechanics* water transforming into ice or a stick of wood burning, not to mention the phenomena of living organisms. In other words, the significance of mechanical atomism as a great philosophical theory is still an open question. However, we can say that the theory has been of immense significance in modern science, that the theory has repeatedly been entertained by scientists as a world hypothesis, and finally that no other theory has ever seemed so full of promise. Hence, though the atomic theory of the Greeks gave the ancient world few means of explaining correctly any particular object or event in nature, none the less their theory was one of the most brilliant hypotheses that the mind of man has ever entertained.

3. Conclusion.—By the end of this early period, when Athens was rapidly becoming "the Hellas of Hellas," immense progress had been made beyond the thought at the beginning of the period a little more than one hundred years before. How great this progress was we can measure best perhaps in terms of the changes it had wrought in the beliefs and customs of the Greek intellectual classes plainly visible in the following period.[1] Several important signs of the revolution rapidly taking place can, however, be pointed out at once. First, the traditional view of the world was evidently breaking down and giving place either to a philosophical mysticism descended from the Orphic religion, to an enlightened skepticism, or to a naturalistic pantheism.[2] Second, the older nature gods

[1] These changes we shall study in the next chapter.

[2] This change becomes especially apparent in the new use of the word, god; for among the thinkers the religious word, god, had become a secular scientific term denoting the primitive stuff or the

such as the sun, moon, and stars were being secularized; for these were no longer thought of by the scientist as gods but as enormous rocks, as fire, or, in general, as strictly natural objects. Finally, the mechanistic explanations of the phenomena of nature and of life were undermining the ancient beliefs and customs of the types we have called magic, animism, and myth. Especially is this noticeable in the rise of Greek medical science with its naturalizing of disease and curative methods and with its mechanistic conception of life, growth, and death. In short, to the intellectual classes magic, animism, and myth were becoming superstitions.

For further study read:

Burnet, J., Early Greek Philosophy, 2d ed.;
Gomperz, T., Greek Thinkers, I, 316–369.

world's source of motion, the creative force. It becomes apparent also in the direct attack upon the belief in anthropomorphic gods.

CHAPTER XI

THE ATHENIAN PERIOD

1. The major political changes in the Athenian period.—Before the beginning of the Athenian period two great events of Greek history had passed, western Asia Minor had come under the political control of the Persian and the Persian invasion of the Greek continent had been repelled. The major events that marked the course of history during the period were: first, the further rapid growth in wealth and culture of the city-state of Athens and the rise of the Athenian empire in the Ægean world; and second, the disastrous wars between the rival Greek states of the Greek continent. The close of the period was marked by the rise of the Macedonian power and the incorporation of the city-states of Greece into the Macedonian empire.

2. Athens the center of greatest Greek culture.—In the early period of Greek science the chief centers of culture had been the cities of western Asia Minor and of southern Italy and Sicily. Now, in the Athenian period, Athens becomes rapidly the leader and remains the intellectual capital of the Mediterranean world until, in the succeeding periods, other cities share with her this honor, but share it only at the time the glory of Greek art, literature and thought is waning. As Athens grows in wealth and political power she becomes the home of the most wonderful artistic and intellectual achievements of Mediterranean civilization, the home of the great sculptors and builders, the home of the great dramatists, the home of

the great historians, the home of the great philosophers, and later the home also of those schools which may be called the first universities.

3. The age of enlightenment.—The first half of the Athenian period, that is, the fifth century, is often called the age of enlightenment. By an age of enlightenment is meant a period in which the intellectual classes are rapidly increasing in number and in culture. Before such an age there may be the intellectual leaders and their immediate pupils but there is no large intellectual class. If at such a time the doctrines of the intellectual leaders become widely diffused, or if for any other reason the class of the intellectually gifted "is roused from its dogmatic slumber" and becomes alert to new problems and new solutions of old problems, then we speak of such a change within a people as "the enlightenment." Usually an enlightenment implies a radical change in the habits or customs of at least a large class of the people, a radical change in their religion, politics, and morals, and a radical change in their conception of the world and of life.

From the nature of man it follows that such a period can be seriously destructive; for it is often easier to break an old habit than to build the new habit by which it should be succeeded. Thus it is easier to lose the religion of one's childhood than to acquire a better religion in its place, and easier to learn to distrust the laws of one's land than afterward to learn to respect a new constitution. In short, an enlightenment can easily be negative only and then it results chiefly in moral and intellectual skepticism. However, even this negative influence of enlightenment is essential to a people's progress; for progress seldom means merely the adding of new habits without the inhibiting of old habits.

Although the early period of Greek thought saw the rise of most of the new and radical doctrines, the Athenian

period witnessed the rapid spread of these doctrines and the rapid enlargement of the intellectual classes especially among the continental Greeks. Of course, the pre-Athenian age had itself to be enlightened or it would have lacked intellectual leaders, for these leaders are the children of their day; but the succeeding period had not only the leaders but also the time to assimilate the new science. Moreover, the Athenian period had besides this advantage of time the advantage also of an extremely stimulating environment, a state in the height of its prosperity and of its political power; for Athens in these days had the wealth to build and to make beautiful, it had the intercourse with other peoples that tended to make it a cosmopolitan city, and it had the free institutions that favor the spread of information. Thus it became a center that could attract from the entire Greek world the men of great talent. No other city of either the sixth or the fifth century was in this respect the equal of Athens in the days of Pericles.

4. The field of the enlightenment.—What was the scope of the Greek enlightenment in the fifth century? Positively, it included the extension of two interests among the people; the interest in the common affairs of humanity and the interest in culture. Negatively, it included a weakening of the blind obedience to religious, moral and social custom. The growing interest in the common affairs of humanity resulted from the growth of the city-state out of the independent villages with their patriarchal government; and this interest in fellow Greeks grew yet larger as the city-state became in turn the great center of commerce and the seat of empire. With the city-state came also democracy and with democracy came instead of *inherited* power and privilege, power and privilege that had to be *acquired*. But to gain great influence in a democracy requires either inborn talent to lead and to control one's fellows or an excellent training that has given

one skill and insight in all matters of public interest, and frequently both of these. In other words, Greek democracies were now offering to all their young citizens of talent the opportunity to win the most desired of prizes but prizes to be won only by competing. Thus grew a demand before unequalled for instruction in all the arts that make the social, the legal and the political leader; and to meet this demand arose a class of itinerant teachers called sophists. These teachers varied greatly in ability, in skill and in information; but the important fact is the evidence given by their large number, by the great distances they often came and by the high pay they received, of an eagerness for the type of culture they professed to instill.

In such writers as Herodotus, Euripides, and Thucydides we have clear evidence of the change that was taking place in the moral and religious life of the intellectual Greek. The old stories of the gods were no longer taken seriously. Religion was becoming less provincial and less superstitious. Customs were being criticised and studied. The customs of foreign lands were being examined with interest and their diversity was being noted and explained. In general, the intellectual Greek was outgrowing local and provincial religion and morality and their blind dogmatism.

5. The new fields of scientific development.—What further fields of scientific interest did the new culture open? First, it made men attend to public speaking and all the arts therein employed. These arts are logical shrewdness and trickery, grammar and rhetoric. As a consequence we find much of the subject-matter of these sciences made the object of reflective research by many of the sophists and their pupils. With the beginning of this reflective research the sciences of logic, grammar, and rhetoric truly began; and these subjects have remained

a field of study and practice from those days to our own. For centuries upon centuries they remained a chief part of the elementary curriculum in the schools of Europe, a curriculum which we may say was first established by these itinerant teachers of Greece in the fifth century.

Second, increased interest was aroused in morals and politics and these customs also were made the object of reflective study. As other customs began unreflective or blind habits, so did morals and politics; for the morals and laws of a primitive people are merely customs obeyed with the blindness of an hypnotic trance and therefore without reflection. Reflection upon such matters can begin only when the people become acquainted with the customs of other lands, when new customs are forced on them, when their own customs commence to conflict with one another, or finally when an increase in population and in wealth and its distribution compel a change of custom. Now the sixth and fifth centuries were such times of change of law and constitution; for these were the days when the old tribal and patriarchal government was transforming into the constitutional and democratic government of the city-state. As a consequence the people became accustomed to see the laws changed and, more than this, to see them made by *men*. Again, a wider acquaintance with other peoples was attracting attention to the marked differences and even contradictions between customs as viewed by the observer going from land to land. As a result, this was a period in which the people of Greece were discovering that laws are not divine but man-made, that the authority behind law is not God but society. This in turn caused a distinction to be made between *nature* and *custom;* nature is inborn, original and divine, whereas custom is man-made, changing, fallible and authoritative only as far as society enforces obedience. This distinction between nature and custom has remained, as we shall

see, with European thought from those days to our own.[1]

This contrast between nature and custom is philosophically of greatest importance. As we have seen, the original authority behind law, religion and all other custom is the group mind. Custom is obeyed because no one even dreams of disobeying it, it is obeyed because of the tremendous power of social approval and disapproval, and it is obeyed because of blind belief in its divine origin and in the dire consequences that follow disobedience. Therefore the greatest of revolutions in man's intellectual life is the discovery that custom is not divine, but man-made, fallible, calling for criticism, and having as its only rightful and ultimate basis of authority the approval of human insight and judgment. When this revolution is complete we have the freedom of thought in politics, morals and religion essential to intellectual democracy and in the long run essential also to political democracy. But of course this revolution never has been complete and probably never can be. It is not complete by any means in the modern world and certainly was not in the ancient world; still the fifth century in Greece must ever be looked upon as the time when the true spirit of democracy first became incarnate in the lives of men. From those days for centuries there was a freedom of thought never since equalled. This does not mean that it was not an age of great ignorance and superstition as compared with our own age of scientific achievement; but it means that men were individually thoughtful and were permitted and encouraged by

[1] For example we find it in the terms, natural and revealed religion, the former the inborn universal religion, the religion of reason, the latter the religion of custom, the religion of the speaker's land. Again we find it in the contrast between natural and civil law, the former not an enactment or custom of man but, as the ancients would have put it, a law of nature, of the reason, of God.

society to think hard and to think as individuals. Men were free philosophically.

For further study read:

Tucker, T. G., Life in Ancient Athens, 1906;
Zimmern, A. E., The Greek Commonwealth, 1911;
Botsford and Sihler, Hellenic Civilization, 275–371;
Plato's Protagoras;
Thilly, History of Philosophy, 40–49;
Encycl. Brit., 11th ed., art. Sophists;
Murray, G., Euripides and His Age (Home University Library);
Nestle, W., Thukydides und die Sophistik, in Neue Jahrbücher für das klassische Altertum, 1914, *17*, 649–685;
Grote, History of Greece, chap. lxvii.
Monroe, P., Textbook in the History of Education, 1915, 52–120.

For more extensive study read:

Meyer, E., Geschichte des Altertums, Bd. 4, 2te Aufl., 85–272;
Gomperz, T., Greek Thinkers, Vol. I, 255–272, 275–315, 412–437, 497–519.

6. Scientific progress along the older lines.[1]—The preceding period had seen the beginning of a genuinely scientific knowledge in fields that we name astronomy, geography, mathematics, biology and medicine. What in turn was the progress made in these fields during the Athenian period? In astronomy the bridge was built between the necessarily speculative astronomy of the earlier study of the heavens and the highly scientific astronomy of the succeeding periods of ancient philosophy. At least two important details must be mentioned. First,

[1] Any knowledge of the details of the progress in the fields of the special sciences made during this and the following periods must be got from books dealing with the history of the sciences, such as those to which the reader is referred at the end of this section.

the habit was formed of conceiving the heavenly bodies as revolving about the earth as a center in great spheres; and unfortunately through the influence of Aristotle this conception became the fixed hypothesis of Greek astronomy in later times. Second, the earth and the heavenly bodies were finally conceived to be spheres. This latter belief was based upon genuinely scientific grounds, such as the shape of the moon during its phases and the changing altitude of the stars as one travels north and south. In geography decided progress was made, due to the more extensive travelling of studious Greeks. Of such travellers the most famous are Herodotus and later Xenophon returning with his ten thousand across Armenia. In addition to the added knowledge due to such Greek travellers there is evidence of knowledge gained from long sea voyages made by Carthaginians south along the coast of Africa and far out into the Atlantic.

In mathematics and biology progress was easier and much greater. In both sciences the influence of the work of the earlier and contemporary Pythagoreans is evident as the source of the great interest of the scholars of Athens and elsewhere. Athens and in particular the school founded in Athens by Plato became the center of mathematical research and in this period the greater part of the mathematics that we know as Euclid seems to have been discovered and formulated. Moreover, the methods of discovery and of deductive proof exemplified in Euclid and philosophically most significant are the work of the mathematicians of this time and especially of Plato and his pupils in the Academy.[1] This was also the period in which medicine and the study of anatomy had their birth as sciences. Hippocrates of Cos is usually regarded as

[1] Of the mathematicians in this period the following are most prominent, Archytas of Tarentum, Hippocrates of Chios, Eudoxus of Cyzicus besides members of the school of Plato.

the father of medicine;[1] at least he and the school of physicians that he founded at Cos raised medicine high above the primitive medicine of earlier days. They studied the empirical symptoms of disease and the observable working of various methods of treatment. In short, with the school of Cos began that empirical medicine which alone could be the correct method of treating the sick until men knew far more regarding anatomy, physiology and the microscopic causes of disease, that is to say, until recent times. However, this statement does not mean that anatomy had to wait until modern times for its beginning. On the contrary, its beginning belongs to this period. The school founded by Aristotle in Athens we know to have studied in the most systematic way the structure of many types of animals and a little later to have begun the study of the different forms of many plants.[2] Mental anatomy, and so psychology, also began in this period in the effort of the Athenian philosophers to analyze the faculties of the human mind, in which endeavor they succeeded in differentiating some of the most marked types of mental traits, such as sensation, imagination, thought, appetition and emotion.

For further study read:

Tozer, History of Ancient Geography, 75–121;
Berry, A., Short History of Astronomy, 1899, 1–34;
Ball, Short Account of the History of Mathematics, 31–45;
Cajori, History of Mathematics, 23–34;
Botsford and Sihler, Hellenic Civilization, 293–302.

For more extensive study read:

Gow, J., Short History of Greek Mathematics, 1884, 1–191;
Cantor, Vorlesungen über die Geschichte der Mathematik.

[1] This he strictly was not for medicine as a science had begun in the preceding period in southern Italy and especially among the Pythagoreans. Hippocrates himself may have been indebted to the latter.

[2] Especially under Theophrastus, the successor of Aristotle.

7. The major philosophical problems of the Athenian period.—The preceding sections of this chapter form but an introduction to the study of the philosophical growth attained in this the greatest age of Greece by her greatest thinkers; and we are now ready for the question: What new philosophical points of view were won and what new problems were raised? What great strides were made in philosophy that permanently advanced the thought of Europe? Negatively, we have already described the period as one of general enlightenment which implies that there was besides the outgrowing of blind custom, a further outgrowing of the mythology, magic and animism of primitive thought beyond the stage reached in the preceding period. Positively, the philosophical growth is to be described as an awakened interest in two new and fundamental problems: First, what ultimately is science and how is science related to the commonplace knowledge of daily life which even the scientist shares with his fellow citizens? Is science possible; and, if so, are it and commonsense compatible? Second, if our laws and morals are but man-made customs and are without divine authority, what is to be the thoughtful man's guide of life and with what authority does this guide of life demand a following? Both problems remain living problems to-day, and the various solutions offered by the great thinkers of Greece remain *essentially* the solutions accepted by most modern thinkers.

These several problems and the solutions offered for them can be studied by us best as they were presented by the intellectual leaders with whose names they have ever since been associated. Moreover, in the many centuries that have followed, these leaders have never permanently ceased to have an influence upon the thought of Europe, an influence that may be called even personal; and the writings they left us that have been preserved, promise

to remain, what for centuries they have been, text-books of the schools of western civilization. Let us then single out from among the many great intellectual leaders of this period for a closer and more personal study five of the most influential and greatest of Greek thinkers. The philosophers we shall choose are Protagoras, Democritus, Socrates, Plato and Aristotle.

CHAPTER XII

THE GREAT THINKERS OF THE ATHENIAN PERIOD; PROTAGORAS AND DEMOCRITUS [1]

1. Protagoras.—Among the teachers and thinkers whom, following tradition, we still call sophists, the greatest seems to have been Protagoras of Abdera.[2] Probably two facts in the intellectual world of his day strongly influenced him: first, what seemed to him the utter futility of the teachings of Parmenides and Zeno; and second, the differences in custom and law observed by him in the several states through which he travelled. The former fact led him to react against science, that is, against the entire speculation of the early cosmologists; and the latter fact caused him to see that though customs differ they are adapted to the actual life of the several states and on the whole are morally and politically successful. In short, Protagoras was a believer in commonsense as against

[1] In my account of the doctrines of Protagoras, Democritus, Socrates and Plato, I am indebted almost entirely to Professor Burnet's Greek Philosophy. His interpretation of these thinkers seems to me at least probable; whereas the traditional and conventional interpretations do not. However, the student should be warned that all interpretations of these thinkers remain still largely conjectural.

[2] Born not later than 500 B. C., visited Athens at least twice, the last time not later than 432 and died after that date. He had many rich pupils and taught many years and is said "to have made more money than Pheidias and any other ten sculptors put together." He is said also to have written "elaborate works;" but none of his writings has come down to us and his teachings have to be inferred chiefly from the writings of Plato.

science and in the practical political and social experience of mankind as against the doctrines of moral and political theorists. He was an empiricist and a pragmatist. Accordingly, we may picture him (of course quite in fancy) teaching somewhat as follows:—"You philosophers have done much hard thinking and in order to do this thinking you have assumed as principles or premises what seem to you indubitable truths; but as a matter of fact you all disagree among yourselves in both premises and conclusions. Therefore something must be wrong. You all ask mankind to give up believing in the world which commonsense and daily trial have shown to be real and instead to believe in a world of atoms or worse yet in a world without even motion or change. Again something must be wrong with your thinking. Now what is wrong with your thinking? Precisely this, that it is mere thinking, that it is a mere air castle; for there is but one way to find out what is true and real and that is by using your eyes and ears and fingers, by perceiving the facts of the world about you. This is precisely what mankind has been doing since the beginning. The resulting beliefs we call commonsense and this commonsense life has fully justified. In short, appeal to facts, accept commonsense, but stop logical hairsplitting and this endless debate that is merely a war of words." Let us picture next his pragmatism.

"To this you philosophers may object that commonsense in one land differs from commonsense in another and that no two men agree even in matters of ordinary perception. I reply: No matter if they disagree, for they are viewing things from different standpoints and so do not see quite the same fact. Of course, one standpoint or point of view may be better than another but strictly speaking we should not reject any genuine perception, for a genuine perception gives us fact. Moreover, here again you are quite misled by your logic; for you think that

consistency is the test of truth, whereas mankind cares little about consistency and rightly cares little. Mankind is engaged in a far more serious enterprise than carrying on a debate. Debating is a mere game and it matters little whether you are right or wrong; but life is a warfare where if you are wrong you meet real disaster or even perish. Now this test of actual life, commonsense has stood and continues to stand. Hence, if beliefs, customs and laws are found by you to differ, do not forget that they all are undergoing, each in its own place, each in its own circumstances the most severe of tests; and do not forget that the differences between beliefs and between customs may be fully justified the moment you consider the circumstances peculiar to the particular people or individual holding the belief or custom. For example, I have travelled far and through many states and have seen indeed many different laws and customs; but what has astonished me, is the fact that they all, as a rule, seem to work well and seem to be the right customs for the states having them. Again, I have met many men of many minds and habits; but here too the astonishing fact is that these men are usually successful and prosperous each in the state of life to which he has been called." This manner of thought, which we have pictured as that of Protagoras, is distinctly a philosophical attitude and one that great leaders of men have often tried to teach mankind since the days of Protagoras. For that matter it is an attitude which every human being unreflectively takes much of the time. Commonsense and perception, not science; success, not argument: is a usual though unexpressed motto. Thus Protagoras as a thinker represents a genuine type of philosophical thought, the philosophy of commonsense.

Let us consider some examples of the use Protagoras not unlikely made of his philosophy. He may have said,

"things are to me as they appear to me, and to you as they appear to you," either without qualifying this statement or without any wish to do so. In this case he seems to teach a doctrine from which we can infer that no error is made by color-blind locomotive engineers, by landsmen judging of distance on the sea and by insane men having hallucinations. Such a doctrine (though it is usually carefully qualified) is called naïve realism and has been severely condemned by philosophers from the days of Protagoras to our own time. Again Protagoras may also have refused to accept such mathematical doctrines as that a line tangent to a circle has but one point in common with the circle; for he may have maintained (if this correctly interprets the reports that have come down to us regarding him) that his eyes told him better, that any such line he inspected has actually some appreciable part in common with the circle to which it is tangent, that is, such a line has not a point but a segment in common with the circle.[1] If your mathematical reasoning does not agree with this, then the disagreement but again shows the danger of abstract thinking divorced from perception. As a final example of how Protagoras may have applied his philosophy to particular problems, let us take one not improbable interpretation of a saying of his regarding our knowledge of the existence of the gods. You cannot by reasoning show whether the gods exist or not; and, we may add, neither can we perceive them to exist. What, you then ask, are we to believe? Protagoras may be pictured as replying: "Believe what mankind for centuries upon centuries has believed and found spiritually satisfying."

The foregoing account of the teachings of Protagoras may be summed up by quoting the words of Professor

[1] Some modern philosophers (such as Berkeley and Berkeleians such as Karl Pearson) would agree in principle with this statement. So this matter debated by Protagoras is still debatable.

Burnet. Protagoras "was a strong believer in organized society, and he held that institutions and conventions were what raised man above the brutes. So far from being a revolutionary, he was the champion of traditional morality, not from old-fashioned prejudice, but from a strong belief in the value of social conventions. In this sense, he not only professed to teach 'goodness' himself, but he believed it was taught by the laws of the state and by public opinion, though not perhaps so well. He had a profound belief in the value of such teaching, and he considered that it begins in early childhood. The less he could admit anything to be truer than anything else, the more sure he felt that we must cleave to what is normal and generally recognized." [1]

2. Democritus.—The second of these great thinkers of the Athenian period was Democritus of Abdera.[2] We may remember him best and most easily by associating with him three facts: first, his contribution to philosophical

[1] Another "sophist" whose name at the very least deserves to be remembered by the student is Gorgias. Gorgias (*fl. c.* 430) was a teacher of rhetoric, whose "influence on Athenian literature, and through it on the development of European prose style in general, was enormous." Under the influence of Eleatic doctrine as well as that of Protagoras, he went further than Protagoras, denying altogether the possibility of science. As the ethical counterpart of this doctrine it is not unlikely that he taught the doctrine, might is right, the ethics of the strong man, the hero, the superman. The point of view represented in modern times by Carlyle and Nietzsche (Burnet).

[2] Flourished about 415 B. C. Little is known about his life. He was, as Protagoras, from Abdera in Thrace. He is said to have visited Egypt and Athens, though this tradition is doubtful. He was a disciple of Leucippus and became the head of a school, that is, he was not a sophist or travelling teacher. Though an excellent and prolific writer his writings have not come down to us. Hence his doctrine is largely an inference from tradition and from a few fragments. In the text I have purposely given his doctrine a *too modern dress*, believing its essential nature would thus stand out clearer to the eyes of the student.

thought was offered directly as an answer to the teachings of Protagoras; second, he was a pupil and follower of Leucippus (though he had also Pythagorean teachers); third, he made a permanent contribution to the theory of human knowledge and of human morals.

Democritus disagreed radically with Protagoras regarding the authority of commonsense and social custom and defended against him the authority of science. Democritus was, to use modern terms, an intellectualist and a rationalist. He did not regard ordinary sense perception as trustworthy or authoritative, rather he believed that perception is always misinforming and misleading. Therefore if we are to get at the truth and at the nature of things, we must depend upon intellectual insight and thought.

As a disciple of Leucippus he inherited both good and bad traits. He was of course an atomist and explained the cosmos and its origin as did his master; and he was a thorough believer that all quality is but hidden quantity. Unfortunately, as an astronomer, Leucippus was far inferior to the later Pythagoreans. For example, he still held the older Ionic view that the earth is flat and that it floats on air. This reactionary astronomy Democritus seems to have accepted from his predecessor.

However, it is his positive contribution to philosophic thought that especially deserves our study, his theory of knowledge and his theory of morals. The former theory is, in the modern technical phrase, a doctrine of representative perception. To understand this phrase let us see one consequence of granting Democritus that *the true nature* of the objects amid which we live and to which we are moment by moment responding, is atomic. For instance, according to the theory of Democritus this piece of paper upon which I write is but a conglomeration of minute particles of matter of different sizes and shapes, so

small that I cannot see them with the naked eye but not so small that I cannot at least think of them in terms of their purely geometrical and mechanical properties. Evidently, then, the paper I actually perceive is not precisely the same paper as that of which science speaks; for the former is one white continuous sheet of paper and looks in no respect like a cloud of dust, whereas the paper of the atomist is remarkably like a cloud of dust. True, I shall be helped to relate the paper seen with the paper of atomism, if I take a powerful lens and look at the paper under this lens; for now at least what I see is no longer a smooth continuous thing but a rough mass made up of thousands of minute intertwined fibres. And a high power microscope would reveal still greater complexity and irregularity. Indeed, might I not see something like a cloud of dust if I had the means of seeing the paper magnified thousands of diameters? Still, though this would help me to relate the two papers, it would make only the more evident that there are two distinct papers, the paper I see with the naked eye and the paper I should see had I this hypothetical instrument that could enable me to see things as Democritus' atomism describes them.

What is the relation between these two distinct papers, the paper of perception and the paper of science? The answer of Democritus to this question is especially important; for over and over in the different generations of European thinkers to our own day scientists have regarded his answer as essentially correct. The real object, thing or, in our example, the paper is a conglomeration of minute atomic changeless particles. These particles can move, can combine and can separate; but nothing that cannot be described in these terms ever takes place in their immortal career. In contrast to them the paper is merely a temporary combination or configuration of thousands or millions of these indestructible atoms. Moreover, these

atoms are always very busy; and could I see them as I can a cloud of dust or of insects or of birds, I should see that no member of the group is ever still, and that the group may be always parting with individual members and gaining other members.[1] What becomes of the many members that thus separate from the group or are even shot off from it as are the minute globules of water from a glass of effervescing mineral water? They shoot out into all directions of space; and some of them bombard my eye, or other organ of sense, and cause some sort of disturbance in my nervous system, which in turn, mark well, is itself but another cloud of atoms. Now the paper that I see is either merely this disturbance in my sensorium or some further disturbance caused by it that we vaguely speak of as my mental state or visual sensation of the paper. Thus in very truth there are two papers, the paper that does the bombarding, the paper fifteen inches from my eye, and the paper of my sensation, the paper that is the *effect* and only the effect of the bombardment and disturbance in the atomic conglomeration I call my nervous system. They are two things, for the latter is not the former but is only a representative of the former, somewhat in the same sense as we should say an ambassador is not a people but a representative of a people. Hence the paper you and I see is not the paper of science but is only a representative of that paper; and what is more, of course you see a different representative from the one that I see. We see, as it were, different ambassadors from the same nation to different foreign governments.

This figure of speech may help us to draw two further conclusions of importance. First, one ambassador does not represent his nation as well as another; for one ambassador

[1] To-day we should state this and the following points in terms of undulations, but of course Democritus lived many centuries before the undulatory theory of light was suggested.

may thoroughly mislead the country to which he is sent and cause all manner of mischief, whereas another may truly represent the thought and policy of his motherland. Second, our reason, that is our foreign minister in the figure, has to *infer* from the ambassador and his words the actual state of public or governmental opinion in the foreign country, for he himself cannot behold this opinion directly. In other words and without figure of speech, our perception of objects varies in the degree to which the contents perceived are genuinely representative of the external objects, and our perception is always an inferential process. In still other words, the paper seen may be in some respects like the paper of science whereas in other respects they may be totally unlike, and we must discover through science, by inference that is, wherein the two papers are alike and what is the true nature of the external object, the so-called real paper. In short, the theory of representative, or inferential perception teaches that what you and I perceive is not the external or real object itself but mental states in our minds caused by the external object bombarding or in some other way stimulating our organs of sense and that we can learn the true nature of this real or external object only through scientific research and inference. Such was not literally but essentially the doctrine or theory of knowledge taught by Democritus.

Let us mark its logical consequence and, as we do so, let us keep in mind the doctrine of Protagoras against whose teachings it was maintained. Instead of perception being the guide of life and an adequate insight into the nature of things, it is far from being either, for it is utterly misleading unless correctly used by the reason as a mere basis for further study and inference. The real world is never to be confused with the world of perception, for the world of perception is a mental world, a mere effect of the real

world acting upon our souls. This misleading by perception and this confusion of two distinct things are especially evident in the commonplace illusions. For example, to one man the room is hot, to another man it is cold; to one man the lantern is red, to another it is yellow; on one day the hills look green, and on another they appear blue; to the hand the oar in the water is straight, to the eye it is bent; to the untutored child the moon looks near, to the astronomer it looks far away. Thus if we stop with mere perception all can be confusion and illusion; but as a matter of fact we do not stop here even in everyday life, for we go on and eliminate from the perceived the illusory and infer the real. If then the perceived world is not quite the real world even for commonsense, how absurd to make it so for the student of reality!

From the little evidence that has come down to us we can infer that Democritus' theory of conduct was as important as his theory of knowledge. We may think of him as arguing somewhat as follows:—It is not true that custom is the last word man ought to say regarding the nature of what is right or wrong. Customs not only contradict one another but are often disastrously ill adapted to the special needs of the people under their sway. Moreover, as a matter of fact men criticise the customs of their land and endeavor to improve these customs and therefore no matter how obscurely apprehended by the reformer, there must be some principles higher than custom by means of which criticism is possible. To use the technical language of to-day, either the changes taking place in custom are and must remain quite blind trial and error processes or there must be such a thing possible as a science of conduct. In short, if one custom is better than another it is the business of thoughtful men to ascertain why.

Why is one habit or custom better than another? Democritus' answer is a landmark in the course of man's in-

tellectual history. Happiness is and should be the goal of life. "The best thing for a man is to pass his life so as to have as much joy and as little trouble as may be." This does not mean the vulgar pursuit of pleasure and especially the pleasures that do not last, for "the pleasures of sense are just as little true pleasures as sensations are true knowledge. 'The good and the true are the same for all men, but the pleasant is different for different people.'" Further, true pleasures last a lifetime whereas false pleasures end in sorrows and pain; therefore again the false should not be mistaken for the true. Finally, if the good is happiness, it is not something without us and beyond our control as riches or luxury; rather it is a state of mind as health is a state of the body, and it is to be attained by "weighing, judging and distinguishing the value of different pleasures." [1] In other words, two important principles are to be laid down: First, happiness or goodness is not a matter of wealth or circumstance but is *a state of mind;* second, goodness *depends upon knowledge or insight*, for the wise alone are capable of discriminating the true from the false pleasure, the ignorant are not. In short, the reason why any man is bad is because he is ignorant and irrational.

These two principles deserve to be carefully studied for two reasons: first, they are typically Greek and endure in Greek ethical thought for centuries; and second, they are a basis of a religion rather than of a science of human conduct. Make the good a state of mind and divorce it from the deeds, the events and the social enterprises that make up human life and history, and you have made it merely a matter of personal discipline. With this done ethics ceases to be a science of man's enterprise, the enterprise of the ages of history and the enterprise of public

[1] Quoted and adapted from Burnet, Greek Philosophy, Part I, p. 200.

and private life. Again, make the attainment of the good a matter of wisdom rather than a matter of law and conduct and you turn moral philosophy from a science into a religion; for now the only means of becoming good is to be a philosopher and the chief reason for becoming a philosopher is to become good. As a matter of fact this change from a science of conduct to a religion was the destiny of Greek ethical philosophy in the succeeding centuries.[1]

For further study read:

Burnet, J., History of Greek Philosophy, Part I, 105–125, 193–201;

Bakewell, C. M., Source Book in Ancient Philosophy, 1907, 57–66;

Plato's Protagoras and Theætetus.

[1] As we shall learn in later chapters. We shall also compare in contrast with it the work of the Roman jurists.

CHAPTER XIII

THE GREAT THINKERS OF THE ATHENIAN PERIOD: SOCRATES AND PLATO

1. Socrates.[1]—Like Democritus the famous Athenian philosopher, Socrates, was an opponent of the teachings

[1] Born about 470 B. C., died 399 B. C. Socrates was an Athenian and lived and died in Athens. In his earlier years he seems to have studied the writings of the older philosophers, to have been the pupil of some of them and to have met others. In particular there is evidence of his acquaintance with the teachings of Empedocles, Philolaus, Anaxagoras and some Ionian philosophers. Further, there is excellent evidence of an early conflict in the mind of Socrates between the Ionic cosmology and the Italic philosophy, with a strong leaning on his part toward the Italic. Indeed, he seems to have been intensely interested in the ancient folk-lore and in the noblest elements of the Orphic and Pythagorean religions and to have combined in his character shrewdness, commonsense and mysticism. He made the acquaintance of Parmenides, Zeno and Protagoras and other sophists. Of these Zeno had the greatest influence upon him, which fact in part at least accounts for the Socratic method, the method of analyzing a theory logically by cross-examining some exponent of the theory, the famous Socratic dialogue. Socrates seems to have attracted attention early in life as well he might, for no Athenian before him had ever had his interests. Young men seem early to have been his admirers and to have gone to him for advice regarding their studies and teachers. Socrates was in several campaigns during the Peloponnesian war and was known for his remarkable personal bravery. In these days he seems to have gathered about him a closer circle of friends and companions that seemed to others at least to be disciples; but he never seems to have had a school or to have had disciples in the strictest sense of that word. However this may be, the circle of Socrates' influence was very wide, much wider than Athens, for it included especially foreign Eleatics and Pythagoreans. At the age of seventy Socrates was brought to trial on a

of Protagoras; but as Democritus represented the Ionic tradition in combating the teachings of Protagoras Socrates represented the Pythagorean tradition. "After the departure of Philolaus for Italy, Socrates became to all intents and purposes the head of the Pythagoreans who remained behind;" for to him they looked as the most authoritative exponent of their common philosophy. However, he was a leader of another type from that represented by Philolaus, for he was deeply interested in Pythagoreanism as a philosophy of life, or as a religion; whereas Philolaus was distinctly scientific in his interest. As a consequence, we find Socrates instructing his Pythagorean followers in the older discarded doctrines of Pythagoreanism regarding the nature of the soul and defending these doctrines against the newer and more scientific teachings. Moreover, he does this with a distinctly religious rather than a scientific interest, for he wishes to prove the immortality of the soul and to outline its career in the life beyond death. That is to say, the more scientific Pythagoreans in these days reflected the thought of the enlightenment by losing interest and confidence in the Orphic and other mystic elements in their philosophy and by increasing their interest in the strictly scientific research carried on in their school, which meant, as we have

charge of impiety and was condemned and executed. But impiety was probably not the real ground of indictment; rather this ground seems to have been political, for Socrates seems to have criticised the Athenian democracy and its leaders and to have been opposed to popular rule believing and teaching that government requires experts as truly as does any trade or craft. As well hand over a sailing vessel to the hands of an inexperienced landsman as the state to the control of the folk. (The view of the life and teaching of Socrates briefly outlined in this chapter presupposes that we have in the dialogues of Plato an endeavor to give a faithful picture of the real Socrates. The traditional and usual account of the life and teaching of Socrates does not accept this premise. *Cf.* Burnet, Greek Philosophy, Part I, pp. 126–128.)

seen, especially mathematics, astronomy and medicine. Of the mind they had come to adopt a physiological explanation, regarding its phenomena as a mere function of the body, or to use the language of that day, as an attunement of the body. This Socrates did not do; rather he directly combats this view of the soul defending instead a distinctly animistic doctrine, according to which the soul is the vital, or life-giving, principle in the body and being itself the source of life is by its very nature immortal. In short, Socrates had in him a deep mystic strain and a moral enthusiasm that made him more than a philosopher, indeed that made him for centuries one of the great saints and religious leaders of the Greco-Roman world.

2. The Socratic doctrine of forms, or ideas.—However, Socrates was not merely a mystic, for he was also one of the keenest of Greek thinkers. Two of the philosophical problems which he endeavored to solve, were virtually the same as those which interested his contemporary Democritus: first, What is the nature of science and how is it related to commonsense, or ordinary knowledge? and second, What is the nature of the good and how is it related to the widely recognized virtues of daily life? To both questions he gives answers different from those offered by Democritus, answers that clearly indicate the influence of Zeno and the Pythagoreans.

The business of science is to discover "the forms." This word "form" can perhaps be rightly translated by the expression "the logical prototype;" and it can be most easily illustrated from mathematics and biology. In nature we never find the triangles, the circles, the straight lines or the equalities which are to be found in geometry. Rather what we find, are at the nearest only approximations to these ideal entities; for no stick or rope is quite straight and without thickness, as required in the geometri-

cal straight line, and, as Protagoras said, no actual circle and tangent have but one point in common, and finally no two bodies are precisely equal in weight, length and number of parts. To use an illustration given by Professor Burnet, we can in practice approach as nearly as we choose to the irrational number π, and thereby square approximately the circle; but actually no one ever has and, we believe, no one ever can square the circle. Now the number π is a form, the triangle also is a form, so are the straight line and the circle and finally so is equality. Again let us illustrate what Socrates seems to have meant by "the form" by taking instances from biology. (Though Socrates himself does not seem to have done so.) As anatomists we may study many specimens of a certain animal type to ascertain what constitutes the type, or what differentiates the type from other related types. For example, what is the cat, that is the type, or "form" *Felis* which the lion, tiger, panther, wild cat and many other species exemplify? In short, such entities as those named by us *the* cat, *the* mammal, *the* vertebrate and countless other animal and plant types are forms. The individual cat, let us say a particular house-cat, is an example of the type; or, as we may put it, the type cat, "the form" is exemplified in this specimen; or again, this cat partakes of the nature of "the form" *Felis*. What then is science? *Science as conceived by Socrates is diagnosis.* It is to be illustrated by the physician judging of the *nature* of an ailment, the morphologist deciding the *type* of a plant or animal, the geometrician discovering the *nature* or *type* of a curve, or the moralist interpreting an act as just. To repeat, the task of science is to discover the nature,[1] the idea or form.

In saying this let us not make the error of calling these forms *classes*, for such they probably were not in the eyes

[1] The physis.

of Socrates. The cat is indeed a class (*felis*). But the cat is also an entity, a form; for as Huxley has told us, the anatomist after studying many specimens commences literally to see a new object, the typical entity, the abstract entity, in this instance, the *cat-form*. Evidently a similar truth holds in mathematics also, where Socrates the Pythagorean would probably have chosen his illustrations. Take for example, the triangle. It is indeed the name of a class, but it is also the name of an entity. It is, as I am this instant picturing it, not a class with an infinite number of members nor is it a mere name, rather it is an entity, "the triangle." It is literally a thing. To repeat, the task of science according to Socrates, is to discover these entities or forms or types: especially the types of geometrical figures, the types of number, the nature of the good and the form of the beautiful.

One further matter needs to be pointed out before we can fully ascertain Socrates' answer to the question: What is science? As Democritus distinguishes sharply between the sensible world of objects and the intellectual, or scientific world of atoms; so also does Socrates distinguish sharply between the sensible world of objects and the scientific world of forms. The world of sense perception is not reality. It is appearance and is therefore something less than genuine reality. Reality being discoverable only by thought or intellectual insight, science alone can reveal this higher world, a world hidden from the ignorant and from those who lack the mystical love or curiosity that impels the scientist onward to explore the realms of true being. In other and clearer words, the real world is not the world revealed to our senses but the world that science gives us in its place; and the relation between the two worlds is that between the appearance of things, or the world seen through a glass darkly, and the reality of things, or the world seen face to face. Things only approxi-

mate the forms. Here unite in one man Socrates the mystic and Socrates the rationalist.

3. The Socratic doctrine of the nature of the good.— The second major problem in the philosophy of Socrates was that of the nature of the good. Indeed for him this probably seemed the more important of the two problems. Of course, the good is a form, the form in which all good acts participate; but what is the definition of the good? Socrates does not tell us and he cannot for the following reason. The good is the very foundation of the world which can be beheld in the philosopher's mystic vision but which cannot itself be analyzed as can the other forms. Or to use a Socratic figure of speech, it is the sun, the source of all light and therefore of all vision but too bright and powerful to be itself the object of sight except to the strongest eyes, if even to them. Here is to be found the height of Socrates' mysticism, a mysticism in which the very secret of the universe, the very goal of science is revealed only to philosophic contemplation.[1] Socrates had in earlier days studied the Ionic science which portrays the world as a blind play of mechanical processes and we have what seem to be his own words of disappointment at the dreadful and cheerless picture given by this theory of the world. To him, as to every deeply religious and mystical temperament, such a world could not be satisfying. Hence the revolt in which he goes to the other extreme; where the world is pictured as in very essence good and divine, where the eternal drama of nature can be understood only by those with the powers to see, not with the eyes of sense but with the ecstasy of the saint, the heavenly vision. But notice that this divine object is not the god of the folk, the god of the ordinary worshipper but the god of the seer, the god of the mystic saint and

[1] Here Socrates shows the influence upon him of the Eleatics rather than of the Pythagoreans.

philosopher, the god whom to see man must have the *amor dei intellectualis.*

Had Socrates taught nothing further regarding the nature of the good he would hardly have belonged at all in the history of ethics. But thus far we have spoken only of Socrates the Eleatic moralist, and there remains to describe Socrates the Pythagorean moralist. This I shall do briefly in terms of modern psychology. The good is not mere skill or efficiency as it would have to be in order to be taught as the sophists claim to teach it. For example, a murderer might be as skillful as the physician or the sanitary engineer. On the contrary the good is mental discipline, or character. In man there are numerous instincts and these conflict in many ways. Each instinct regarded by itself is neither good nor bad; for each is a purely blind impulse. Hence it is only the rivalry or conflict between the instincts that raises the moral issue. To illustrate, I tend to fight and lord it over my enemy, but I tend also to avoid danger and this I can do by submitting to him. Which shall I do, for it is impossible to do both? Here first arises a moral question. How would Socrates answer such questions? Not, as we have seen, by declaring some of our instincts to be good and others to be bad; but by pointing out that we must reconcile our instincts by giving to each free play as far as such freedom is consistent with the well-being of the entire man or by keeping each held strictly to its proper function in the enterprise of life. But who is to do this ruling and peacemaking? Certainly not the blind impulse of the moment, but our intellect. In short, the moral man is the man *ruled by reason rather than by impulse,* the man who *deals justly with all his instinctive tendencies,* the man who prevents any one of these instincts becoming his master and therefore the tyrant over the other instincts. Socrates' favorite name for goodness is *justice,* a name that is quite appro-

priate, for goodness is justice within the commonwealth of a man's total nature. The Pythagorean name is also appropriate, the harmony of the soul, for a good man, is a man at peace with himself. He is temperate, he is courageous, he is wise. He is the first, when appetite submits to reason. He is the second, when he is guided by reason in determining what is to be feared and what is not. He is the third, when reason is the ruler over all his impulses. Finally, he is just when his total nature is thus in harmony. In contrast the bad or unhealthy soul, the unjust man, is he who allows one of his appetites or baser impulses to lord it over the reason and thus to be life's moral tyrant.

4. Plato.[1]—In passing to the philosophical doctrines

[1] Born 427 B. C., died 347 B. C. A man of noble family whose ancestors and relatives had played an important part in the days of Athens' greatest glory. He was only in early manhood when Socrates died and it is doubtful how far we may call him the immediate pupil of Socrates. In any case Socrates was known to him from his earliest childhood and his near relatives were ardent admirers of the great master. After the death of Socrates Plato did much travelling which took him as far as Sicily. In these travels he became acquainted directly with leaders in Greek thought, Eleatics in Megara and Pythagoreans in Magna Græcia. Both parties influenced him greatly. He returned to Athens profoundly interested in mathematics, astronomy and dialectics, or logic. But up to this time he lacked a philosophy that can be distinctly called Platonic and his literary work, including his greatest masterpieces, had been done seemingly with the purpose of extolling his own family, of revealing Socrates to the world and of indulging a wonderful dramatic talent. Upon his return he conceived the plan of founding a school in Athens after his own pedagogical beliefs. He was already familiar with the school of Euclid in Megara and with the school of Isocrates in Athens. To the latter the school of Plato of course becomes a rival establishment though it would seem a friendly rival. Moreover, the custom was rapidly growing for young men from distant parts of Greece to come to Athens to be instructed. Herein the fourth century differed from the fifth, for in the latter century teachers came to Athens rather

of Plato we have come to the thoughts of another generation in the Athenian period; for we have passed from the fifth century and have come to the fourth, to the year 368 B. C. thirty years after the death of Socrates.[1] Plato is now a man sixty years of age and he has been carrying on the work of directing his school for approximately twenty years. These twenty years and the twenty that immediately follow them mark the turning point in the history of Greek thought. Up to this point there has been steady progress; but from this point the decline begins, for in Plato we meet Greek philosophical genius at its highest point of achievement. Unfortunately a full and direct account of the instruction and research proceeding in the Academy during these years has not come down to us nor has a full and systematic account of the teachings of the master, its founder. What we have instead of such direct accounts are but indirect and casual statements, a few echoes, as it were, of the mighty industry hidden

than pupils; but now the pupils also are coming. The founding of Plato's school, the Academy, was an important event not only in the history of education but also in the history of Europe. The school became a genuine seat of scientific research where important further steps were taken to solve the problems of mathematics and astronomy and seriously to begin the classification of animal and plant life. Out of it came virtually the famous treatise of Euclid and the basis of the later Greek astronomy. Moreover, the school was important because of the type of students it attracted. Many of these were men that were to be rulers and legislators in many parts of the Greek world. Thus it was both theoretically and practically a school of political science.

All of Plato's published writings have come down to us; but we quite lack his lectures which no doubt would give us a different picture of the thinker and his doctrines from that given in books meant chiefly for the intellectual public. These writings, Plato's Dialogues, form one of the grandest prose collections that the genius of man has ever produced; and they bid fair to be read, studied and enjoyed as long as man remains civilized.

[1] The probable date of Plato's Theætetus.

behind the walls. That is, we have the casual publications of Plato himself dealing with a few matters concerning which he wished to take the entire learned world into his confidence and we have the casual remarks and criticisms of Aristotle and others bearing on the teachings of Plato within the school. However, we have enough evidence to give at least a probable answer to the question: What were the interests of Plato, to what influences from others was he indebted, what were the fields of his research, and what were the general results of his thought and investigation?

In the first place, we must not think of the Academy as a school of philosophy in the narrow sense but as a genuine university in the modern sense; and we must not think of Plato as a professor of philosophy but as the president and director of a university, and perhaps the greatest university president, or rector that the world has ever possessed. He founded the school and managed its affairs; he directed its research and instruction which not only dealt with all the learning of the day but was adding important newly discovered information to every department of Greek science; finally he himself by his own thought and research was contributing to this remarkable progress, winning for himself a name immortal as long as men study logic, mathematics, astronomy and philosophy. The research that he directed and in which he took part extended from mathematical and astronomical investigation to the solution of the political problems of the time; and the philosophy that he taught came not only from a vast experience in the field of science and of human affairs but also from the fact that Plato's entire intellectual environment compelled him to be a philosopher, we might almost add, even against his will.

5. Plato's contribution to science.—Before considering Plato's place in the history of European philosophy let

us briefly sum up his probable contributions to mathematics, astronomy and political science. It is highly probable that the mathematics contained in the famous work of Euclid came largely from the Academy and in no small part through Plato. Again, we know from Plato's own writings that he was thinking out the solution of problems that lead directly to the discovery of the calculus. Indeed there are probably only four or five names of mathematical discoverers that stand between Plato on the one hand and Newton and Leibniz, the discoverers of the calculus, on the other hand; and mark that two or three of these names belong to a time as recent as the seventeenth century.[1] In astronomy we have directly from his writings hints of his teaching in the Academy. It may be going too far to say that Plato is the father of the heliocentric hypothesis; but it is not going too far to say that this theory has in him a forefather. For example, not only did he teach with the Pythagoreans that the earth is a sphere, that it is a planet, and that it revolves about some central body; but he looked forward to finding through the discovery of some planetary system a way of accounting for the irregular motions of the planets by reducing these motions to circular motions seen from a moving earth. In political science Plato was the most influential man of his day. The Academy was the school of statesmen and legislators and through these his pupils Plato seems to have exerted a marked influence upon the legal thinking of the time and thus to have been one of the authors of Hellenistic law. Hellenistic legal customs and thought not unlikely in turn influenced the legal colonial customs and also the legal thought of Rome in later days and so we can with probability speak of the Academy as one of the ultimate sources of Roman and so of modern jurisprudence. If the future research of scholars jus-

[1] Cavalieri, Wallis, Barrow.

tifies these inferences [1] regarding the influence of Plato in his own day and the contributions made by him to the science of all time; it will prove no exaggeration for us to have said that in public affairs, in science and in education Plato was one of the most influential men that ever lived. And we have not yet stated his contribution to philosophic thought!

6. The Platonic philosophy.—The teachers of Plato in philosophy were pre-eminently Socrates and after Socrates' death the Eleatic and Socratic philosophers in Megara and the western Pythagoreans in Sicily. In other words, Plato was very closely related to the same major movements in Greek philosophy in the fourth century as was Socrates in the fifth century; but the new century had brought with it many changes. Socrates' rather crude doctrine of "forms" required either to be discarded or to be thought through. For example, if there are forms such as the triangle, are there forms also of hair, of dirt and of any object that you may mention? Again, are there forms of the forms, that is, does the triangle itself participate in a higher form? Still again, what is the relation between these mysterious forms in which objects participate and the objects themselves? Do the forms literally constitute an existent world by themselves? Finally, what is a form? Briefly stated, the Greek answer to these and related questions constitute what we to-day call the logic of predication and the logic of classes. In other words, these Greek thinkers were struggling with problems whose solution is part of the science of logic; and the world owes to Plato and to his pupil Aristotle virtually all the knowledge of logic possessed by Europe until in the nineteenth century logical discovery really once more began.

The growth of logic is historically a matter of great

[1] Of Professor Burnet, to whose work on Greek Philosophy this chapter is directly indebted.

philosophical importance. Our entire conception of the nature of science depends upon our knowledge of logical theory; for our logical theory is little more than a summing up of our scientific experience and of our reflective insight into the nature of the enterprise upon which we as scientists have been engaged. If then our logic is restricted as was Plato's and Aristotle's to the logic of predication and to that of classes, it follows that we shall think of the business of science as finding the predicates or forms of things or virtually *their definition* and the forms of these forms or virtually *classification*. That is to say, the business of science is to define and to classify, to do for the world at large what the morphologist does for the world of animals and plants. That is, the morphologist studies animals and tries to discover what constitutes the type, and in turn he studies these types and tries thereby to discover the higher types and so finally to get the system that we call the classification of animals. Thus if science is limited to definition and classification, it becomes literally a universal morphology.

True as it is that part of the business of science is to define and to classify, as biology, chemistry and mineralogy witness to-day; still this is evidently not the whole enterprise of science, as even Greek mathematics itself witnesses. However, the strong impression that this is the whole of science became, from these days in the Academy, part of European philosophic thought and continued to be a part until the rapid growth of modern science in recent centuries made it evident that such an hypothesis of the nature of science is altogether inadequate. Now the interesting fact that follows from this belief that definition and classification constitute science is the resulting conception of the universe, a conception that was to play a major part in European thought from the time of Plato until in the seventeenth century science returned again

to the world conception of Democritus. If definition and classification are all of science and therefore if we are to conceive the universe in their terms alone; then we must picture the world as a great hierarchy of forms extending from the concrete individual things about us, the objects of our sense perception, through the higher and higher forms up to the highest form, the ultimate form or fundamental principle of all things. That is, the world is a vast classified system similar to the classification of the animals, except that the classes are themselves thought of as things, forms or principles; and each object is what it is because of, and owes its existence to, the forms in which it participates or that are working as secret powers within it. This world-picture may properly be called the *feudalistic* conception of the world; and, as we have stated, it came from Socrates, Plato and Aristotle and remained a typical European world-conception until a new civilization in modern times brought into existence a new science, a new logic and a new world-picture.

7. Plato's defense of science against the Eleatics of Megara.—Closely related to Plato's logical studies was his answer to the nihilism of the school of Megara. It is characteristic of most periods in European thought even to our own day to have the tradition of Parmenides represented by some thinkers who maintain, as he did, an extreme monism, or the doctrine *that all is one* and that science is therefore fundamentally erroneous. Such monists are so hypnotized by the thought, "*the world is one*," that they rest intellectually satisfied with some type of mystical contemplation or ineffable philosophy and at the same time they endeavor to show the futility of the efforts of science to study the world in its parts, to find the elements of these parts and in general to investigate nature inductively and analytically. In Plato's day Parmenides lived again in the Eleatics of Megara. As Zeno before them had shown

that motion was impossible, so they now go logically deeper and show that any instance of predication or classification whatsoever is self-contradictory. What is, is; and therefore when you say anything further about an object either you are merely repeating that it is what it is, or you are saying that the object is something that it is not. For example, if you call two objects horses, you are at once involved in the contradiction, these objects are both two and one, are both alike and different, or again are each exclusively and precisely what it is and yet are both horses. Plato at once shows that such a nihilist annihilates himself, for the moment he opens his mouth he himself does precisely what he condemns science for doing, namely, he predicates. But of course it is not enough to split hairs with such a monist, for science has to show the source of his quite honest difficulties and to make clear the true nature of her enterprise. Thus Plato was called upon to analyze predication and to show how two objects can share the same predicate. This he did and in so doing be became again a founder of the elementary logic of predication and of classes.[1]

8. In Plato's philosophy mathematics is the fundamental science.—Still, it is not Plato's logic that makes him seem almost a modern philosopher, rather it is the place he believed to be held by mathematics in the hierarchy of the sciences. We shall see in the next chapter how Aristotle regarded biology as the fundamental science and in later chapters how this Aristotelian doctrine controlled European thought down to the sixteenth century when Europe again came to believe, *as did Plato*, that the world is fundamentally a mathematical world, and that mathematics is therefore the fundamental science.[2] This fact

[1] The familiar logic of our elementary text-books.

[2] Thus it is a rule of modern philosophy that the scientist should always endeavor to reduce the problem he is trying to solve to a

in modern European history and the fact that Plato as a philosopher also believed that the world is essentially or fundamentally mathematical, make him the most modern thinker of the Greeks and make modern scientists Platonists to an extent that few of them apprehend. Indeed, it is this doctrine and the doctrines aforementioned that deserve especially the name *Platonic realism;* for by realism is meant (1) the battle for science against mystical monism, (2) the making of logic the pre-eminent interest and labor of the philosopher, and (3) the belief that mathematics is the fundamental science or that the world is fundamentally mathematical. Of all thinkers who consistently uphold these three enterprises or principles, Plato is the master.

9. The world-soul.—Still, Plato was not altogether modern; for compared with Democritus he was in some things a reactionary, as was Democritus when compared in other things with the Pythagoreans. Expressed in simplest form, the modern believes that the world is a sort of perpetual motion machine, that motion is constant and eternal, that the world is not in need of entities that can keep giving it new supplies of energy. The atomists of the school of Abdera believed much the same, for this school taught as a basic premise that the atoms are moving in all directions through space and they presupposed no other source or control of motion. In contrast, Plato believed in a doctrine that was a direct descendant of primitive animism. The mark that distinguishes the living creature is self-motion and the entity within the body that makes this self-motion possible is the soul. In other words, the soul is a creator of energy and were it not for

mathematical problem; and it is certainly one of the wonders of the world that man has in the past three centuries succeeded in reducing countless problems to mathematical ones and has thus succeeded in solving these problems in terms of mathematics, until to-day mathematics is the queen of the sciences.

such creators of energy motion would cease. Moreover, what is true of the living body is in turn true of nature, the universe about us and above us, for unless there is a world-soul there would be no source of the world's motion. This world-soul may be called the god of Plato.

10. Plato's cosmology.—We may now consider the foundation of Plato's cosmology. The ultimate sources of the world are three: first, the ultimate chaos, the unformed matter, which in Plato's thought seems to be equivalent to what we call space; second, the forms, that is, the fundamental mathematical principles of science; third, god, the world-soul who as the source of motion makes chaos become the cosmos by exemplifying mathematical law. A possible illustration of this none too clear doctrine is the following imaginary modern analogy. First, think of the universal ether of modern physics, the medium of light, electricity and other energies, but think of it as absolutely without disturbance or motion of any kind. Let us call this Plato's chaos. In terms of modern physics there would then be not only no light, heat or electricity but also no matter, no chemical elements, for matter is electricity, a disturbance in the ether. Second, think of the laws or doctrines that we may call mathematical physics. Let us call these Plato's forms. Third, think of a power that can set up disturbances in the ether, an imaginary substitute for Plato's world-soul. Now to have the world, the world of light, electricity and matter, come into being this power has but to set up in the ether disturbances that are in accord with the principles of mathematical physics; or put conversely, given the world of physical science we can trace it back to three sources; the ether, the mathematical laws of physics and the prime-mover who sets up disturbances in the ether that exemplify mathematical physics.[1]

[1] In this cosmology also Plato is a Pythagorean.

Finally, we may indicate Plato's position in the history of theology by building the following scale. The first position, atheism or pantheism, is held by Democritus in his doctrine that nature has no creator other than itself. The world is, in modern phrase, a perpetual motion machine. The second position is held by Plato. A god or world-soul is needed to be the source of motion in the world. The third position is held by later Greek Platonists who make God the source not only of the world's motion but also of the laws or principles of science, that is, of all that is essential to transforming chaos into a cosmos. In short, they identify God with two of Plato's world principles. The fourth position is held in Christian theology when God is thought of as creating the world out of nothing, when He thus becomes in men's minds the only source of the world. In short, God is here the author of all three of Plato's world principles.

For further study read:

Encycl. Brit., 11th ed., arts. Socrates and Plato;
Taylor, A. E., Plato, 1909;
Burnet, History of Greek Philosophy, 105–192, 205–233;
Bakewell, Source Book in Ancient Philosophy, 86–103, 148–216;
Plato's Euthyphron, Apology, Crito, Phædo, Symposium, Protagoras, Republic, Theætetus, Parmenides, Sophist and Statesman;
Taylor, Aristotle on His Predecessors.

For more extensive study read:

Burnet, History of Greek Philosophy, 205–350;
Nettleship, R. L., Lectures on Plato's Republic, 1901;
Windelband, Platon, 3te Aufl. 1901;
Pater, W., Plato and Platonism, 1893;
Adam, J., Vitality of Platonism, 1911;
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CHAPTER XIV

THE GREAT THINKERS OF THE ATHENIAN PERIOD: ARISTOTLE[1]

1. Introductory.—To have their names become household words has not commonly been the lot of philosophers. "Yet there are a few philosophers whose influence on thought and language has been so extensive that no one who reads can be ignorant of their names, and that every man who speaks the language of educated Europeans is constantly using their vocabulary. Among this few Aristotle holds not the lowest place. We have all heard of him, as we have all heard of Homer. He has left his impress so firmly on theology that many of the formulæ of

[1] Born 384 B. C. in Stagira, died 322 in Chalcis in Eubœa. Son of Nicomachus, court physician to Amyntus II, king of Macedonia. Came to Athens at the age of eighteen and entered Plato's Academy where he remained for twenty years a member of the scientific group gathered around the master. After Plato's death Aristotle spent several years in the Troad in Asia Minor. In 343 he received the call to be tutor to the prince Alexander, later Alexander the Great. In 335 he returned to Athens and founded a separate school from the Academy. This school has ever since been called the Lyceum from the building in which it was housed; and it has been called also the Peripatetic school from the fact that Aristotle instructed in the *peripatos* or covered portico of the building. Until the death of Alexander Aristotle remained occupied with the management of his school in the Lyceum. After the death of Alexander a charge against him similar to that brought against Socrates, compelled him to flee to Chalcis where he died the following year at the age of sixty-two.

His published books have almost entirely been lost; and with the exception of his essay on the Constitution of Athens only the edited lecture notes of the master have come down to us.

the Churches are unintelligible without acquaintance with his conception of the universe. If we are interested in the growth of modern science we shall readily discover for ourselves that some knowledge of Aristotelianism is necessary for the understanding of Bacon and Galilei and the other great anti-Aristotelians who created 'the modern scientific' view of Nature. If we turn to the imaginative literature of the modern languages, Dante is a sealed book, and many a passage of Chaucer and Shakespeare and Milton is half unmeaning to us unless we are at home in the outlines of Aristotle's philosophy. And if we turn to ordinary language, we find that many of the familiar turns of modern speech cannot be fully understood without a knowledge of the doctrines they were first forged to express. An Englishman who speaks of the 'golden mean' or of 'liberal education,' or contrasts the 'matter' of a work of literature with its 'form,' or the 'essential' features of a situation or a scheme of policy with its 'accidents,' or 'theory' with 'practice,' is using words which derive their significance from the part they play in the vocabulary of Aristotle." [1]

2. The relation of the philosophy of Aristotle to that of Plato and Democritus.—A study of Aristotle reveals two philosophies. In the one philosophy Aristotle is the loyal follower and successor of Plato and is an important contributor to the Platonic tradition. In the other philosophy Aristotle is a rebel rejecting Platonism. Judged from a modern point of view Aristotle is progressive in his Platonism and is reactionary in his Aristotelianism. Judged from the standpoint of the historical evolution of modern thought Aristotle in becoming the great teacher of Europe misled the intellectual enterprise of Europe for many centuries until in the last three centuries science has rejected his leadership and has returned to the philoso-

[1] Taylor, Aristotle, p. 7.

phy of Democritus and to that of Plato. Democritus was modern in his mechanical atomism and in his doctrine of representative perception. Plato was modern in giving to mathematics the position of fundamental science and in accepting those astronomical hypotheses which were leading directly toward the heliocentric astronomy. Aristotle was not modern, but from the modern point of view was reactionary, in rejecting a mechanical or mathematical conception of the universe and in offering mankind in its place a biological, or vitalistic conception; and he was reactionary in rejecting the Pythagorean astronomy and in returning to the doctrine that the earth is the motionless center of the universe. Again, Aristotle was not modern but reactionary in rejecting the evolutionary hypothesis of Ionic science, the hypothesis that the universe and the entire present order of existent entities have arisen out of relatively chaotic conditions, and in teaching instead of this evolutionary doctrine the doctrine of the eternity of the present astronomical world and of the present types of earth's living and lifeless objects.

Because ancient and medieval Europe adopted Aristotelianism the three hundred years from 1600 to our own time have been an era of struggle in which the modern thinker has had to outgrow Aristotle and fight the Aristotelian tradition. Perhaps this fact will be recognized, if I add that the two greatest anti-Aristotelians in modern times are also two of the most prominent men in the history of modern science, Galilei and Darwin. Of course, in calling Aristotle a reactionary we must remember we are partisans and not historians. As historians we should add the statement that we were judging merely from the point of view of the past three centuries of science. The science of future centuries may return to Aristotle. At least Aristotelianism is still with us and there are to-day signs of rebellion against modern mechanism. However, these

are matters to be discussed later. At present it is enough that we appreciate first the marvellous influence of Aristotle upon European thought to modern times, as compared with the influence of Plato and Democritus, and second the return of modern thought to the leadership of these two men whom Aristotle in great part supplanted.

3. Aristotle the Platonist.—We have seen first that the Socratic and Platonic doctrine of ideas leads the philosopher to conceive the work of science to be the task of defining and classifying the world's objects, and second that this doctrine of ideas is in part responsible for the rapid advance in the fourth century of the logic of definition, of predication and of classes. Precisely how much logic Aristotle learned in the Academy and how much he discovered and thought out independently we may never know; but in any case Aristotle gave the schools of Europe their text-book in logic for all the intervening time from his day to our own.[1] In other words, Aristotle gave to Europe essentially the logical doctrine of definition, of predication and of classes employed ever since; and he taught Europe that to define and classify are the chief business of science,[2] until a new age and a new civilization gave Europe other masters.

There are other features of the Aristotelian logic besides the logic of definition and classification. One that must be mentioned is his belief in the thoroughly deductive nature of scientific inference, and therefore of science, a doctrine that is called rationalism. According to this teaching science is not only a deduction from some finite number

[1] A few additions to the Aristotelian logic have of course been made in the traditional logic. Some of these were made by the Stoic logicians in the later periods of Greek philosophy.

[2] Therefore, it is the duty of every student of European thought to become acquainted with the Aristotelian logic as it is given in some one of the numerous elementary text-books of logic used in the schools of Europe and America.

of ultimate premises but these ultimate premises are axiomatic, or intuitively known truths. Thus there is held out to the scientist the hope of making his teaching an infallible and final body of demonstrated truth, instead of the warning that, do his best, his doctrine is but the result of an experimental, or trial and error process, a result which is to be entertained only tentatively and which he must expect to see outgrown in the course of further research. Indeed Aristotle probably regarded his own work as the *ne plus ultra* of science.

Aristotle was a Platonist also in rejecting the mechanistic explanation of nature and in adopting the doctrine of forms. The ultimate stuff of which all things are composed is not capable of itself developing into the cosmos and into the organized objects we behold about us as the eastern atomists taught; for there must be working in nature besides the mechanical and the chance configurations of clouds of atoms genuinely formative principles. Since then matter can of itself do nothing but can only under the influence of the forms become a cosmos; the chief, if not the only object of scientific study is these forms, or formative principles. In this common doctrine, however, Aristotle differs radically from Plato, who regarded these forms as essentially mathematical, by regarding them as essentially biological or animistic. In short, Aristotle was a Platonist who, because of his interest in biology, turned vitalist.

4. Aristotle the vitalist.—Plato was at heart a mathematician, Aristotle a biologist. Therefore we must understand Aristotle's biological bias in order to understand what is probably its peculiar consequence, the Aristotelian doctrine of forms. To do so let us consider the following commonplace facts of life.

The living entity is remarkably unlike the lifeless, in its origin, growth and reproduction. The acorn is the

offspring of the oak and of nothing else. The acorn is fated to grow into the oak and into nothing else no matter how closely it may resemble other seeds. When the growing acorn reaches the oak stage, it stops its transformation as though this were the goal it had been seeking from the beginning; and now as an oak it produces other acorns which also are predestined to the same career as that through which the parent oak has passed. What is true of the acorn is true in general of every living seed or egg and of every living creature in its development from the seed or egg to the mature *form*. Hence if in our theory of life we keep close to life as the layman observes it, we shall have to make somewhat the following statements: Every seed has in it a principle that determines its growth and the goal of that growth; every seed is the offspring of a parent that has already reached this goal and the parent provides in the seed the principle by which the seed in turn is predestined to the same goal as that reached by its parent; finally the stuff out of which different living creatures are composed shows no such specialization, for the food of one plant or animal is shared in common by many other types of plants and animals. In other words, this food is an *unformed* stuff which each living creature assimilates and *transforms* into its own tissue according to the principle working within the seed. For example, acorns seem to absorb much the same food as do the chestnuts and other similar trees, but the acorn transforms this raw material into an oak tree and the other seeds into trees after their kind. Again a kitten and a puppy both drink milk but this food is transformed by the one into the tissues of the cat and by the other into the tissues of the dog. A similar story awaits us as we proceed to describe that remarkable feature of life which we call mind. Minds not only develop from seeds but exhibit the same faithfulness to type. Again minds have the same remarkable

capacity for predetermining the product of minds that the mature creature has in predetermining the character of its offspring. For example, the idea in the mind of the sculptor predetermines the form of the statue, or the idea in the mind of the craftsman the outcome of his handiwork, or finally the problem before the mathematician predetermines the character of the resulting thought, the solution of his problem. Formulated as principles these facts may be described thus: Every living entity develops from an unformed state by means of a form working within it, and every living entity is indebted for this form to a parent that has already attained the formed stage. Nowhere do we find crude matter capable of developing without the influence of such a form into living creatures.[1]

So far we might call Aristotle merely a biologist of what we to-day call the vitalistic school, but he does not stop there. What is true of life is true of all nature, and these principles of life are universal philosophical principles. All motion or change in the universe is a *transformation*, an evolution under the stimulus of an indwelling form or of a form acting from without; and this stimulus must come from that which has itself already reached the formed state. Further, these forms constitute a hierarchy, for one stage may be but the raw material or potential stage of some yet higher stage; that is, life may give life to lifeless matter but this lifeless matter is not itself wholly unformed, for it may be earth or water or fire, in other words, *forms* of matter, and again our minds may transform what is far from lacking all form, as they do in building a temple out of cut stone.

[1] Though Aristotle did make the unfortunate mistake that lower forms of life could develop out of, for instance, mud or putrefying meat under the influence of the sunshine, as do seemingly frogs and flies.

These principles have or suggest a number of consequences. First, the higher, or the formed must be as truly ultimate as is matter, for matter cannot change without the influence of forms. Second, every species or type must be eternal, for matter cannot evolve without the influence of that which is already formed; and therefore there can be no genetic evolution from less organized types to more organized types such as biology to-day believes to have taken place. In short, the present order of the universe is eternal. Third, there must be one or more highest forms; and as these can develop no farther, they are pure forms and not the matter, or potential stage of some yet higher type. Aristotle decides that there is but one such highest, or pure form, God, who is thus the prime form, or mover of the universe, the eternal source of all stimulation and of all resulting transformation.[1] Briefly put, nature would stop without God's presence acting upon it. Fourth, there extends from God to the lowest organized matter a scale of intervening forms. Finally, two dogmas of Aristotle should be added to these four consequences. Aristotle believed that totally unformed matter is nowhere to be found [2] and he seemed to regard the highest reason exhibited in man as the highest type of organized

[1] This is a principle with consequences of great historical and philosophical importance both in the centuries immediately following Aristotle and in later centuries. It implies that the world is not a perpetual motion machine. It implies that nature depends directly upon the supernatural to keep it transforming. In short, it flatly denies naturalism, the doctrine of modern as well as of Ionic science. Thus in the history of science this inference of Aristotle was a distinctly reactionary movement, a movement back toward primitive thought, and a movement that led to the greatest philosophical battle in all history, the struggle between medieval Aristotelian science and modern science.

[2] That is, earth, air, fire and water cannot be analyzed physically. This dogma tended to impede the early efforts to analyze matter, efforts that in time resulted in the founding of chemical science.

matter. From the latter, it follows that God is pure thought or reason.

5. The Aristotelian cosmology.—"There is no part of Aristotle's system which has been more carefully thought out than his physics; at the same time it is almost wholly on account of his physical doctrines that his long ascendency over thought is so much to be regretted. Aristotle's qualifications as a man of science have been much overrated. In one department, that of descriptive natural history, he shows himself a master of minute and careful observation who could obtain unqualified praise from so great a naturalist as Darwin. But in astronomy and physics proper his inferiority in mathematical thinking and his dislike for mechanical ways of explaining facts put him at a great disadvantage, as compared with Plato and Plato's Pythagorean friends. Thus his authority was for centuries one of the chief influences which prevented the development of astronomy on right lines. Plato had himself both taught the mobility of the earth and denied correctly that the earth is at the center of the universe, and the 'Copernican' hypothesis in astronomy probably originated in the Academy. Aristotle, however, insists on the central position of the earth, and violently attacks Plato for believing in its motion. It is equally serious that he insists on treating the so-called 'four elements' as ultimately unanalyzable forms of matter, though Plato had not only observed that so far from being the A B C of nature they do not deserve to be called even 'syllables,' but had also definitely put forward the view that it is the geometrical structure of the 'corpuscles' of body upon which sensible qualities depend. Aristotle reverts to the older theory that the differences between one 'element' and another are qualitative differences of a sensible kind." [1]

The earth is the motionless center of the universe.

[1] Taylor, Aristotle, pp. 51 f.

About it revolve spheres that carry the moon, sun and other planets and the stars; and if we assume these spheres to be numerous enough, the seeming irregularity in the motions of the planets and stars can be explained. This doctrine of the heavenly spheres was of course older than Aristotle but Aristotle seems to have been the author of the unfortunate hypothesis that these spheres were material entities and not merely mathematical abstractions. The world above the moon is essentially a changeless world, a world more divine than the world below and quite incorruptible; and to make this seem more consistent Aristotle teaches that its matter is different from earth, air, fire and water found here below the moon, for the spheres are made of a fifth substance. [1] This doctrine of a non-earthly substance and of the incorruptibility of the heavens seems distinctly reactionary when compared with the Ionic astronomy; and it became one of the obstacles that the new astronomy had to overcome in the time of Galilei. It made the world of astronomy a fundamentally different world for physics to explain from the world forming man's earthly environment; whereas the great triumphs of modern astronomy have been due to the philosophic hypothesis that the same physical science holds in both realms and hence that the starry world is a world of change and evolution no less than is the world of our immediate environment.[2]

Another historically important but unfortunate Aristotelian doctrine,[3] closely related to the foregoing hypothesis, is that the perfect, eternal and fundamental form of

[1] Hence the word "quintessence," the name of this substance.

[2] Immediately beyond the farthest sphere is God, the source of all motion within the world. Thus the supernatural realm and the dwelling place of God are identified with the physical heavens and remain so identified until modern days. Of course, this doctrine also was a return to primitive thought.

[3] That again Galilei was long afterward to disprove.

motion is the motion *seemingly* exhibited by the heavenly spheres, namely, motion in a circle, whereas motion in a straight line is essentially earthly and transitory. Plato's Academy taught the opposite, and so of course does modern science, for motion in a straight line is according to the principle of inertia logically fundamental to mechanics and to motion in a circle and uninterfered with this motion is eternal.

Finally, one more unfortunate doctrine of Aristotle must be mentioned because of its historical importance. This doctrine has to do with the nature of space and its limits. Aristotle regards space as a container or vessel to be defined accordingly in terms of its bounds or sides. Thus it follows from the very definition of space that space is limited or of finite extent. From this in turn Aristotle inferred that the farthest heavens are the bounds of space and so of the universe in space, and not only that the universe is finite but that the earth is literally its center. In modern phrase, not only is the solar system geocentric but so also is the universe. No wonder that a Europe brought up on Aristotle was shocked and even enraged to be told in the sixteenth and seventeenth centuries that the universe extended indefinitely in space and that instead of the earth being the center and a quite important part of the world system it is only an infinitesimal speck in an infinite world, a world not related to it in any prominent way.

6. Aristotle's philosophy of life.—While Aristotle's small interest in mathematics hindered him in astronomy, his great interest in biology may have helped to make him the great moralist that he was. In his ethical writings there is evidence of marked philosophical progress beyond any study of man's life and its problems which has come down to us from the preceding centuries. Indeed so little have modern moralists progressed beyond his "Ethics"

that this book still seems to many an excellent elementary text-book. In this respect it is comparable to his logical treatises.

The element of progress in Aristotle's moral doctrine that perhaps deserves most to be mentioned is the discovery that man's nature is fundamental to ethical science.[1] To use the term with which we have now become familiar, the business of the moral and political sciences is to discover the highest "*form*" of humanity, which means a form, or nature to which untutored man is capable, or, in Aristotle's phrase, to which non-moral man is the "matter," to which he has "the potency." The ideal of mankind is thus synonymous with "man's true nature," and his true nature has to be discovered by studying man. What is the true nature of man? Aristotle replies: We see it clearest in the most intellectual and the most highly socialized life of man. Differently expressed, man is by nature intellectual and social; and therefore the ideal life is the life of the philosopher, the life of the citizen in a free city-state and the life of friendship. Of course, modern students of human nature find Aristotle's list of man's traits altogether too short and modern moralists find many details of his teachings inconsistent with our democratic ideals. From our modern point of view its

[1] In more modern terms, man's inborn endowment or instincts are at the basis of his moral life, for his moral life has developed out of his pre-moral or instinctive life. In this development, however, the inborn nature has not disappeared but has simply been redirected in some places, being weakened here and strengthened there. The nature of man still rules and always will rule mankind, and it will determine his moral judgments and be behind his ideals. Hence there could be no more absurd psychology or ethics than hedonism or any form of the doctrine that man seeks pleasure as such or that happiness as such is the goal of man's life. Man's life, even his moral life, is as peculiar to him as is the life of a bird to the bird or of the cat to the cat. Therefore completely dissociated from the study of the peculiar nature of man, moral science is a mere war of words.

greatest gap is its deliberate and typically Greek omission of the practical life as contrasted with the life of study, of politics and of leisure. This was an unfortunate omission, because in the days to come the contemplative life becomes exaggerated into the only ideal life of man and easily becomes not scientific but religious and ecstatic contemplation, the meditation of the mystical philosopher and of the monastic saint.

Man's nature is complex and as a result man can rarely satisfy all of his tendencies to respond to some given situation. His members war with one another; and therefore a large part of moral science is concerned with reconciling these contestants. Aristotle's solution of this war of man's members is the famous doctrine of the golden mean. Reason must enter into the struggle between the rival tendencies of man's nature and direct his blind impulses and appetites. Reason can reconcile them by showing the virtues, the golden means. For instance, it reveals courage the mean between foolhardiness and cowardice, liberality the mean between avarice and extravagance, and modesty the mean between bashfulness and shamelessness. "This mean is not the same for every individual and in all circumstances, it is 'relative to ourselves,' and it is 'determined by reason, or as a right-minded man would determine it.' It is not, however, a matter of subjective opinion or arbitrary choice:" [1] It is a matter of moral insight and man has to develop in himself such insight or conscience. Finally, to make man moral, as opposed to allowing him to remain instinctive, is not to give, as some seem to think, moral instruction merely but to build in man by long and constant practice those habits which constitute what we call character. In short, moral education aims at two things, conscience and character.

[1] Thilly, History of Philosophy, p. 90.

For further study read:

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Johnson, E. H., Argument of Aristotle's Metaphysics, 1906;
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For more extensive study read:

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Aristotle's Politics (transl. by Welldon and also by Jowett);
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CHAPTER XV

THE HELLENISTIC AND ROMAN PERIODS

1. Introductory.[1]—By the time of Alexander the Great a new Greece had come into being, a spiritually decadent Greece. Signs of its coming date back at least to the beginning of the fourth century, when political vigor and solidarity are waning in the Greek city-states, when Greek art and literature are losing their classic purity and beauty, and when men are becoming more seriously engaged in making their peace with the great hidden powers behind nature by means of magic and hypnotic suggestion than in understanding and controlling the world through science and skill. The most civilized part of the world was losing its nerve. This loss of nerve, apparent in the year 330 B. C., becomes greater and greater in succeeding centuries; until it reaches its maximum in the western Mediterranean world in the days preceding Charles the Great and in the eastern world in the days when the Arab supplants the Greco-Roman.

Such an era of decadence lasting a thousand years was extremely complex. It was complex because man and society are complex and because the Greek and Roman empires included many peoples and cultures and were therefore themselves extraordinarily complex. Now in a complex entity one part may be changing while another is constant or one part may be changing more rapidly

[1] In the first and second sections of this chapter I am indebted to Gilbert Murray's brilliant book, Four Stages of Greek Religion, Lectures III and IV.

than another or again one part may be improving while another is degenerating. All of these characteristics of a changing complex entity were present in the intellectual, artistic, religious, social and political life of the Mediterranean world during these one thousand years. In some respects we may call the Augustan age the greatest epoch in the history of Mediterranean civilization; for it was a time of universal peace, a time of widest intercourse and closest affiliation between all the peoples of the ancient world, and a time of greatest prosperity: but in other respects it was far inferior to the Greek city-states of the sixth and fifth centuries B. C.; for by this time that spiritual excellence which had made Greece the light of the world had become a tradition, a memory rather than a living and energizing present experience. With this spiritual and in particular with this intellectual decadence we are directly concerned.

What is spiritual decadence? Spiritual decadence includes not only the slowing down and stopping of spiritual progress away from primitive thought but also the coming back or the spreading to wider circles of society of primitive customs and beliefs. It involves a loss of intellectual self-confidence and ambition, a loss of the habits of research and verification, an increase of blind belief and obedience, and an increase of suggestibility and hysteria. It involves also a similar moral loss, a loss of the ambition, self-confidence and hopefulness of the pioneer, a loss of the sturdy independence and vigilance of the free citizen and a loss of self-restraint and social co-operation and efficiency. If these are the underlying psychological factors in spiritual decadence we may expect the following to be the phenomena of decadence. The mob mind and its government are more in evidence in politics and in religion. An uncritical acceptance of tradition characterizes religion, art and science. The religion of the folk becomes increas-

ingly a practice of magic and hypnosis and returns to animism, myth and hero-worship. Science becomes scholastic, that is, it changes from research to mere argumentation. The strong arm of the despot and military leader alone can bring order into the troubled political world. The political adventurer wins by becoming the favorite of tyrants and not by service to the state and the people. On the one hand, luxury increases in the sense that men make its enjoyment an almost bestial neglect of all other occupation and interests. On the other hand, those who seek the better life are obliged to go to the opposite extreme, to renounce luxury altogether, to become puritans and ascetics. Virtue becomes less leading an active and useful life as a member of the family, of the circle of friends and of the state, and becomes more a mere state of mind. The world becomes less a place that rewards virtue, skill, diligence and intelligence. Instead it becomes a place that seems governed by the god Chance or Fortune rather than by the god Righteousness. In such a world the wise man withdraws and seeks to make himself independent of fortune. He seeks those treasures which the world cannot take away; he sets his heart on a world beyond the evil and confusion of earth; and he finds at last his peace in God, a peace that passes human understanding. Such was the period that we have now to study.

What were the causes of this decadence? This is a question for the student of general history to answer rather than one for the student of philosophy. No doubt the former would call our attention to such underlying causes as the political and economic conditions of the time and he might mention further such yet deeper causes as the declining birth rate, the growth of cities, the increase of slavery, the concentration of wealth, the increase of the proletariat, and the killing off through war of the best strains in the population. Whatever the causes, the free

Greek city-state is disappearing and Greek imperialism is taking its place. The Greek world soon embraces the old empire of Persia and Egypt, and becomes ruled by military despots and their successors, who vary from a hero "to a vulgar sot or a corrupt adventurer." Greek culture spreads over the many principalities but Oriental culture also makes inroads into Greece; and thus a cosmopolitanism partly Greek and partly Oriental is to be found in the great cities. Following Greek imperialism comes that of Rome. Now Greek and Oriental cosmopolitanism travels farther west and Mediterranean civilization becomes a vast political unit made up of many peoples and many cultures. Among them are Persians and Syrians, and Jews, Egyptians and Phœnicians, Greeks and Italians, and Celts. How vastly different the social and political life of the Roman Empire from that of Athens in the days of Pericles! Still, Greece had the highest culture to offer the Empire and the Empire took what she was capable of absorbing and this was no small amount.

2. Religion.—Three aspects of the intellectual life of the Hellenistic-Roman period belong especially within the scope of this book—the religious, the philosophical and the scientific. Let us first consider the religious aspect.

The religious aspect has been admirably described by Professor Murray in the following words: "Any one who turns from the great writers of classical Athens, say Sophocles or Aristotle, to those of the Christian era must be conscious of a great difference in tone. There is a change in the whole relation of the writer to the world about him. The new quality is not specifically Christian: it is just as marked in the Gnostics and Mithras-worshippers as in the Gospels and the Apocalypse, in Julian and Plotinus as in Gregory and Jerome. It is hard to describe. It is a rise of asceticism, of mysticism, in a sense, of pessimism; a loss of self-confidence, of hope in this life and of faith

in normal human effort; a despair of patient inquiry, a cry for infallible revelation; an indifference to the welfare of the state, a conversion of the soul to God. It is an atmosphere in which the aim of the good man is not so much to live justly, to help the society to which he belongs and enjoy the esteem of his fellow creatures; but rather, by means of a burning faith, by contempt for the world and its standards, by ecstasy, suffering and martyrdom, to be granted pardon for his unspeakable unworthiness, his immeasurable sins. There is an intensifying of certain spiritual emotions; an increase of sensitiveness, a failure of nerve.

"Now this antithesis is often exaggerated by the admirers of one side or the other. A hundred people write as if Sophocles had no mysticism and practically speaking no conscience. Half a dozen retort as if St. Paul had no public spirit and no common sense. I have protested often against this exaggeration; but, stated reasonably, as a change of proportion and not a creation of new hearts, the antithesis is certainly based on fact." [1]

The traditional religion was by the time of Plato bankrupt. It failed in two tests. First, the myths, such as the tales found in Homer and Hesiod, could no longer be believed by any enlightened man and to such men as Plato they were even blasphemous. Moreover, not only were they incredible as stories but the conception of the gods they presupposed was too primitive and even savage for men who had reached a far nobler insight into the nature of the ultimate godhead. And the savage ritual had become repulsive. Second, the traditional religion failed to satisfy "men's ethical requirements and aspirations." Here "it was if anything weaker than elsewhere. Now a religious belief that is scientifically preposterous may still have a long and comfortable life before it. Any

[1] Four Stages of Greek Religion, p. 303 f.

worshipper can suspend the scientific part of his mind while worshipping. But a religious belief that is morally contemptible is in serious danger, because when the religious emotions surge up the moral emotions are not far away. And the clash cannot be hidden."

One consequence of the loss of the traditional religion, especially the Olympic, was that the world seemed no longer governed by gods who punished injustice and wickedness and who could be influenced by the motives and purposes of men. Rather the world seemed governed by Chance or Fortune. This is the goddess and "happy is the man who knows how to placate Fortune and make her smile upon him!" A sentence from Pliny makes the principle clear. "Throughout the whole world, at every place and hour, by every voice Fortune alone is invoked and her name spoken: she is the one defendant, the one culprit, the one thought in men's minds, the one object of praise, the one cause. She is worshipped with insults, counted as fickle and often as blind, wandering, inconsistent, elusive, changeful, and friend of the unworthy. . . . We are so much at the mercy of chance that Chance is our god." [1] Evidently, this is the doctrine that human effort does not count. It is the natural response to a world filled with great catastrophes and changes, a world in which military leaders were making superhuman conquests not in the name of their gods but in a spirit of hospitality to all the religions that crossed their paths. There is little difference between this belief in chance and the belief in fatalism. Still the doctrine that all is due to Fate or Destiny can be the nobler and indeed becomes most noble in the teachings of the Stoic philosophers that the divine Destiny or Providence rules in all things.

Two other important aspects of the new religion were the deification of the heavens and the deification of man.

[1] Quoted by Murray, p. 114.

Even by the older philosophers and especially by Plato the sun, moon and stars were already spoken of as divine. Now when the Oriental influence has become direct and welcome, the cults of the heavenly bodies and the wandering stars become popular indeed; and many ways to strange magic are open. Of these ways the one open to astrology must be especially mentioned. One ancient author tells us: "Other nations despise the philosophy of Greece. It is so recent and so constantly changing. They have traditions which come from vast antiquity and never change. Notably the Chaldeans have collected observations of the stars through long ages, and teach how every event in the heavens has its meaning, as part of the eternal scheme of divine forethought. . . . By the risings and settings of the stars and by the colors they assume, the Chaldeans predict great winds and storms and waves of excessive heat, comets and earthquakes, and in general all changes fraught with weal or woe not only to nations and regions of the world, but to kings and to ordinary men and women." [1]

In this religion of the stars the world below the moon and the planets is markedly distinguished from the world of the fixed stars. Here below is the world ruled by Fate and Chance and evil demons but beyond these changeable stars is the home of the ultimate God, the land of freedom and bliss. There above is our true home, for our souls are sparks of divine life, effluences of the stars. Thither we shall return after death; "but in the meantime? In the meantime there are initiations, sacraments, mystic ways of communion with God. To see God face to face is, to the ordinary unprepared man, sheer death. But to see Him after due purification, to be led to Him along the true Way by an initiating Priest, is the ultimate blessing of human life. It is to die and be born again." [2]

[1] Quoted by Murray, p. 124.
[2] Murray, p. 128.

This brings us at once to another characteristic and related doctrine, that of a mediator between God and man. There is the priest but behind the priest there is some greater teacher in the land from which he has come and behind the latter there is some still greater master ever more remote, from whom the magic rites and the revelation originally came. But beyond all is "the one eternal Divine mediator, who being in perfection both man and God can alone fully reveal God to man, and lead man's soul up the heavenly path to its ultimate peace. This mediator descends from God through the heavenly spheres. There is associated with him the ancient belief in the dying and suffering god. When his work is done he ascends to Heaven to sit by the side of the Father in glory." However, besides the mediator there is a direct way by which the heavenly vision is given to men, to men of especial piety and prophetic power. This way is the trance and ecstasy of the saint, involving sometimes the temporary departure of the soul from the body and its union with God.

Besides the deification of the world of the heavens is the deification of man. From time immemorial all of these peoples in the eastern Mediterranean world had been accustomed to the conception of the God-man. In the olden time the heroes and the kings had been divine; still if they were divine, were they any greater than these conquerors and emperors whose mere word seemed sufficient to bring the superhuman to pass? Are these men not members of that hierarchy of lesser gods by which the will of the ultimate God and His providential care for man are made manifest in the happenings of this lower world?

But to the nobler religious men of these days not the worldly powerful deserves most to be deified for all men are sons of God and have come from God, and the divine manifests itself in man not by the deeds of the mighty but by the helping of our fellow man and by the life of the

spirit. To which statement may be added, as an instance of the intense moral enthusiasm of these days, the noble ending of a document that may be called a swan song of ancient paganism. "Souls that have lived in virtue are in general happy, and when separated from the irrational part of their nature, and made clean from all matter, have communion with the gods and join them in the governing of the whole world. Yet even if none of this happiness fell to their lot, virtue itself, and the joy and glory of virtue, and the life that is subject to no grief and no master are enough to make happy those who have set themselves to live according to virtue and have achieved it." [1]

Finally, there is to be mentioned as a characteristic trait of the religion of this period, a tendency related to astrology and in part a consequence of the disbelief in the older yet sacred myths. I refer to the practice of allegorical interpretation, which completely reconciles the sacred character of the myths, ritual and magic with their seeming absurdity and savagery. The ancient myths and customs are not to be taken literally but to be interpreted spiritually. God talks to man in allegories and the spiritually minded alone can hear the true message. But what are the limits of such divine allegories? Evidently there is none, for this interest in and approval of allegorical interpretation opens a way that leads directly to the most fanciful and absurd hypotheses that mysticism may suggest. The ancient savage myths are filled with noble truth, the sacred writings of old are full of hidden meaning and require a mass of commentary to bring this meaning to the reader. Even the world about us and our life within it are but allegories. All is allegory; and if we might only see with the eyes of faith and behold the world from the heavenly point of view all would be clear. The true world

[1] Sallustius, On the Gods and the World (translated and published by Murray in his Four Stages of Greek Religion, p. 214).

is above the moon, this world is but a delusion to the sinner and an allegory to the saint. Such was a belief of thoughtful men in Hellenistic and Roman days and such, we shall see, remained the belief of Europe throughout the middle ages.

Of course all of these many doctrines, as held and put into practice by the people of the Greco-Roman world, varied from primitive superstition and savage magic on the one hand to the noblest and most spiritual mysticism on the other hand. The complete story is almost infinitely complex and I have given only its barest outlines. Such in essence was the religion of these many centuries, becoming more markedly primitive as science and philosophy became more and more decadent. Such was the religious atmosphere into which Christianity entered. Such indeed remained in principle the religious atmosphere of Mediterranean and western Europe even to modern days.

For further study read:

Murray, G., Four Stages of Greek Religion, 1912, 103–214.

For more extensive study read:

Wendland, P., Hellenistisch-römische Kultur, 1907;

Cumont, F. V. M., Oriental Religions in Roman Paganism, 1911.

(For a short and select bibliography *cf.* Murray, Four Stages of Greek Religion, p. 153 f.)

3. Philosophy.—From the beginning Greek philosophy had never been thoroughly secular, rather it had been "a way of life," a religion. This religious character of philosophy had been especially prominent in the western tradition in its two chief branches, the Pythagorean and the Eleatic; but in the Athenian period, in Sicily, in Athens and in Abdera, among both Pythagorean and eastern atomists, astronomers and mathematicians there had been signs of research becoming purely scientific. And this

tendency toward pure secularism was not, as we shall see, without its effect in the following period. Still, the most powerful influences at work in the philosophy of the Athenian period and even in Athens itself were semi-religious and ethical. Socrates, Plato and Aristotle, in addition to their distinctly secular or scientific interests, had a marked Pythagorean interest in the welfare and destiny of the soul. They showed also a marked religious interest, over and above their distinctly scientific interest, in the world of the stars; for the world of the fixed stars seemed nearer God even to Plato who, as we have seen, all but entertained the hypothesis that contradicts the very central thought of the Orphic-Pythagorean religion, the astronomy that we moderns know as Copernican.

In the Hellenistic and Roman periods the tendencies to secularize science gradually become weaker and finally die; whereas the religious and ethical tendencies encroach more and more upon the scientific until philosophy becomes a purely religious philosophy, or theology. These tendencies are already prominent before the end of the fourth century. The philosophers, or intellectual leaders are ceasing to be men of research, investigators, or unprejudiced enquirers after truth, and are becoming prophets, preachers and "guides to the better life." They come not to argue but *to convinse*, not to enquire but *to persuade*, not as seekers after truth but as *those speaking with authority*. The voice is no longer the voice of the Greek philosopher of the sixth and fifth centuries but the voice of the Semitic prophet whose message begins "Thus saith the Lord." And remarkable to add, many of the most prominent of these philosophers of life were not Greeks, though *they taught in Athens*, but *Semites*. Greek philosophy is passing, precisely because Greece herself is passing; for another world, a bigger world is coming into being, a world of which Greece is only a part. So too, the

unique prominence of Athens is passing, for other rich and cultured cities are now becoming metropolitan seats of learning. Among these Alexandria is the most famous. Here meet men of all the Mediterranean countries and of the countries farther East. Here Persian, Semite, Egyptian, Greek and later Roman are all at home. Their language may be Greek but their thought, their beliefs and their customs are of many lands.

However, the prophet-philosopher is not merely a prophet. He is also a philosopher. It is true, he has a message to give mankind and he delivers this message not as the outcome of research or as something requiring to be verified; still if you hear his voice and obey his call, he will offer you proof afterward. Then too, there are rival voices; and he must combat these voices and in turn make his own message impregnable against their attacks. Now, proof and argumentative attack and defence require a philosophy, an array of fundamental premises. And to secure this philosophical foundation the prophet-philosopher goes back to the philosophical teachings of the sixth and fifth centuries; but what he selects depends upon his controversial, pedagogical and apologetic needs rather than upon an open-minded scrutiny. In short, philosophy remains a chief subject of study and of writing during these periods and indeed for seventeen hundred years; but it becomes a philosophy that is traditional and apologetic, and it remains such until a new civilization is born and the genuine spirit of curiosity and research again inspires the intellect of man. In saying this we must not undervalue these periods and the many centuries that follow; for these seventeen centuries are important philosophically. True, the philosophical changes are few and take place slowly. None the less these centuries mark the passing of the old civilization and the birth of the new; they form the bridge between the two great ages; and they have left in our

modern intellects vestiges of themselves which promise to remain there as long as European culture itself endures.

The philosophical tendencies of the Hellenistic and Roman periods have two other characteristics in common. The first of these two characteristics is the appeal "to universal belief," or the *consensus gentium*. This tendency was not new; but it now becomes dominant and explicit. Even throughout the preceding periods the philosopher rested his case upon its logical consistency and the intellectual satisfaction it afforded rather than upon objective and experimental verification. That is to say, there was a marked subjective strain running through all Greek thought. This trait now comes prominently to view in the dominating conviction that the belief of all mankind and the belief of great antiquity are an ultimate authority or proof. What has been believed *semper, ubique, et ab omnibus* is as such true. Of course this appeal to universal belief, to the *consensus gentium*, was really but an appeal to the beliefs of the age, to the beliefs that were spreading throughout the Mediterranean world or to the beliefs of extreme antiquity, which had in previous centuries spread throughout that world. In any case, it was not what the philosopher of that time thought it, as we can see who judge of it from a distance and as he could not for he lived amid men who knew no other culture. He thought it man's innate and infallible reason speaking, he thought it God in man and through man pronouncing the eternal verities. We know it to be the peculiar product of the remarkable religious, social, political and economic environment of the Mediterranean world and the neighboring Orient.

The second remaining characteristic common to the philosophical tendencies of the Hellenistic and Roman periods is still to be mentioned. The major problem of

the wise man is to free himself from destiny, from the fortunes and misfortunes of this world beneath the moon. Of course, this trait was simply part of the general religious tendency of the age which we have already studied. The wise man, or later the holy man, differs markedly from the fool and the sinner; for he is independent of fortune. He has renounced the wicked world and its pomps and vanities. His mind and heart are set on the goods that no man can take from him or on the world that passeth not away. Thus, the philosopher and the ascetic hermit become species of the same genus. There is the common aim, to be free from the world that the ordinary man values so highly, the world that cannot satisfy, the world that is but vanity, and finally to be free from all the sinful lusts of the flesh. Briefly put, no matter how philosopher may differ from philosopher and quarrel with philosopher, one and all appeal to the universal beliefs of mankind and one and all seek to free mankind from chance or fortune and from the world and the flesh.

4. Scientific progress.—The general drift of the intellectual life of the Hellenistic and Roman periods was more and more nearly limited to the religious current. None the less, it would be an error to assume that the special sciences died with Aristotle or even ceased to progress immediately after his time. On the contrary, all the sciences of the fourth century continued to progress during the third and reached their highest mark in this century. But by the year 200 B. C. the progressive spirit indispensable for scientific research was steadily declining; and as the centuries passed science became more and more a tradition, more and more a mere study of the scientists of former days. Yet even such study to be critical or thorough requires scientific acumen and learning and these too were passing away; for by the end of the Roman period the scholar could at the best compile inferior elementary

text-books out of the older material with little, if any, critical insight or scientific self-confidence.

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Botsford and Sihler, Hellenic Civilization, 627–656.

For more extensive study read:

Heiberg, J. L., Naturwissenschaft und Mathematik im klassischen Altertum, 1912;

Dannemann, F., Die Naturwissenschaften in ihrer Entwicklung, 1910;

Gerland und Traumüller, Geschichte der physikalischen Experimentierkunst, 1899.

(a) **In geography.**—For one science especially the Hellenistic and Roman periods were highly favorable, that is, for the growth of geographical knowledge. The conquests of Alexander carried his soldiers into India and central Asia and made possible a more extensive and more nearly accurate knowledge of the eastern world as far as western India and central Asia; and some information even regarding China was available for the later geographers. At the same time that this wider knowledge of the Eastern world was acquiring, a remarkable expedition under the leadership of Pytheas of Massilia explored the western coast of Europe, the coast of the British Isles and the coast south of the German Sea. With the expansion of the Roman Empire the amount of such information regarding both the East and the West increased, so that by 150 A. D., the known world included also Central Europe, the British Isles, Southern Russia, a considerable stretch on the eastern and western coasts of Africa and the sources of the Nile. However, the most significant progress was the endeavor to ascertain the size of the earth, whose spherical shape was now fully accepted by geographers, and to ascertain the latitude and longitude of the different important centers, so that world-maps of some

accuracy might be constructed. The height of this geographical progress was reached in the famous map constructed by Ptolemy about 150 A. D. In addition to this interest in mathematical geography there was marked interest in physical geography, shown especially in the study of the tides on the Atlantic coast and in the study of volcanoes and other mountains and of the changes taking place on the earth's surface. Finally, a far more extensive knowledge of the peoples of the known world and of their customs was acquiring through the reports of soldiers and travellers. Thus geographical information reached its maximum by the end of the second century after Christ; and from that time men depended more and more upon what earlier students of geography had written, and their interest and knowledge kept decreasing.[1]

For further study read:
Tozer, History of Ancient Geography, 98–370;
Botsford and Sihler, Hellenic Civilization, 635–639.

(b) In astronomy.—The mathematical research in astronomy from Plato to Ptolemy was of the highest importance, especially the work done in the third century

[1] The men that deserve especially to be remembered because of their contribution to geographical knowledge or because of their compilation of earlier writings on geography are: Pytheas of Massilia, *fl. c.* 330 B. C.; Dicæarchus of Sicily, *fl. c.* 320 B. C.; Eratosthenes of Cyrene, *fl. c.* 240 B. C. (for his measurement of the earth); Hipparchus of the island of Rhodes, *fl. c.* 140 B. C. (for his investigations of the parallels of latitude and meridians of longitude); Posidonius of Syria, *fl. c.* 100 B. C. (for his travels and descriptive geography); Polybius of Megalopolis in Arcadia, *fl. c.* 170 B. C. (for his descriptive and historical geography); Strabo, *fl. c.* 20 B. C. (the great geographer of the Augustan age who sums up the existing geographical knowledge); Pliny, *fl. c.* 60 A. D. (for his compilation of the knowledge contained in the writings of earlier authors); and finally Ptolemy (and his immediate predecessor Marinus Tyrius to whom he is greatly indebted) of Alexandria, *fl. c.* 150 A. D.

B. C. One of the tragedies of history is that the heliocentric hypothesis was explicitly entertained by one small group of astronomers in this century [1] only to be rejected by the majority who followed Aristotle. However, the work of both groups raised mathematical astronomy from a speculative to a definitely scientific stage. Summed up in briefest outline, this progress in mathematical astronomy included the calculation of the size of the earth, the distances of the sun and moon, the location of eclipses in the heavens and the more nearly accurate calculation of their times of occurrence. It included the further discovery of irregularities in the paths of the sun, moon and planets and the attempt to account for them by circles, circles whose centers lay on the circumference of other circles (epicycles) and by eccentricities. Finally, it included the discovery of the refraction of light by the earth's atmosphere and, in general, an enlargement and an increase in the accuracy of such information as that which belongs in an astronomical almanac.[2]

For further study read:

Berry, Short History of Astronomy, 34–75;
Botsford and Sihler, Hellenic Civilization, 639–641.

[1] The most important name in this smaller group is Aristarchus of Samos, *fl. c.* 270 B. C.

[2] Besides Aristarchus the astronomers that deserve especially to be remembered for their contributions to astronomy in these periods are: Eratosthenes (already mentioned for his estimate of the size of the earth); Hipparchus of Rhodes, *fl. c.* 140 B. C. (the greatest mathematical astronomer of the ancient world); and, after almost three hundred years of little if any progress, Ptolemy of Alexandria, *fl. c.* 150 A. D. "His reputation rests chiefly on his great astronomical treatise, known as the *Almagest*, which is the source from which by far the greater part of our knowledge of Greek astronomy is derived, and which may be fairly regarded as the astronomical Bible of the middle ages." The history of Greek astronomy practically ceases with Ptolemy.

For more extensive study read:
Heath, T. L., Aristarchus of Samos, 1–350.

(c) **In mathematics.**—Mathematics also made great progress during the Hellenistic period, especially during the third century B. C.; for this was the century of the three most famous mathematicians of the ancient world, Euclid, Archimedes and Apollonius. This progress was centered in the work of the school of Alexandria at which most mathematicians either studied or taught. The school of Alexandria was a lineal descendant of the Academy at Athens as it in turn was a descendant of the school of Pythagoras. To sum up the numerous details of mathematical history during these centuries in a few sentences is difficult; but the important facts for the student of philosophy to note are these. The third century before Christ saw elementary geometry, conics and arithmetic reach the stage where further progress was virtually impossible until new methods were discovered; but these new methods were not to be discovered until eighteen hundred years later in the sixteenth and seventeenth centuries. Besides geometry, conics and arithmetic the beginnings of mechanics were made by Archimedes. Moreover, it is important to note that Archimedes' method of study laid those foundations of geometry which rest on measurements and on exhaustions and was therefore the beginning of those discoveries which, again in the seventeenth century, led to the discovery of the calculus. To the mathematics of the third century later mathematicians added the beginnings of trigonometry and algebra. The names especially associated with the former are Hipparchus and Ptolemy and with the latter Diaphantus of Perga, that is to say, with men who excepting Hipparchus lived in the second and third centuries after Christ. Finally, it is to be noted that Rome did not contribute to either astron-

omy or to mathematics. Her part in the history of these sciences was to transmit a few quite elementary text-books to the schools of the middle ages.[1]

For further study read:

Ball, Short Account of the History of Mathematics, 31–109;
Cajori, History of Mathematics, 29–83;
Gow, History of Greek Mathematics, 192–315.

For more extensive study read:

Cantor, Vorlesungen über die Geschichte der Mathematik.

(d) **In medicine.**—Finally, we must consider briefly the medical progress in these periods; for, as we have seen, one of the important factors in enabling man to outgrow primitive thought and custom and to become rational in his response to the world about him is the growth of knowledge regarding the structure and working of his body and regarding the causes and the cure of disease. The early Hellenistic period was also the time when medical science reached its highest point of development in the ancient world and the school in which this happened was also the school of Alexandria. There human anatomical research was permitted and encouraged, possibly because of the Egyptian custom of embalming the dead and partly because of vivisection permitted upon criminals condemned to death. But in the early stages of medicine anatomy without physiology is not especially helpful except to surgery; and this explains why surgery flourished especially

[1] The names of mathematicians belonging to this great period in the history of mathematics that deserve especially to be made familiar are the following: Euclid, *fl. c.* 290 B. C.; Archimedes of Syracuse, *fl. c.* 250 B. C.; Apollonius of Perga, *fl. c.* 220 B. C.; Hipparchus of Rhodes, the great astronomer, *fl. c.* 120 B. C.; Ptolemy of Alexandria, the great geographer and astronomer, *fl. c.* 150 A. D.; Pappus of Alexandria, a geometrician of eminence, *fl. c.* 300 A. D.; and Diophantus of Alexandria, probably *fl. c.* 250 A. D.

in these days. Medicine had to progress by an empirical study of the history and symptoms and by the experimental treatment of disease; and there did arise in Alexandria an "Empiric" school of physicians which followed the best part of the Hippocratic tradition and which raised Greek medicine to its highest stage. In short, these centuries of the early Alexandrian school saw Greek medical science reach in surgery, obstetrics and the nursing of the sick a stage comparable with modern medicine in those respects where modern medicine does not depend upon the enormous growth of physiological science and of the knowledge of the causes of disease.

None the less, the period of progress was short here as elsewhere. Soon came the days when medical science became either a mere tradition or a mere speculation. Rome was no more constituted to progress beyond Greece in medicine than she was in mathematics and astronomy. Hence her part was to learn what Greek teachers had to give and to hand on in her text-books what she had acquired.[1]

For further study read:

Botsford and Sihler, Hellenic Civilization, 631–635.

[1] The most noted names in the history of medicine belonging to these periods are the following: Herophilus of Alexandria, *fl. c.* 300 B. C.; his contemporary Erasistratus of Alexandria, and the founder of the empiric school (possibly Philinus of Cos, a pupil of Herophilus). Noted names in Roman medicine are Celsus, probably *fl. c.* 1 A. D. and Galen, *fl. c.* 170 A. D. The former was a mere compiler of information and is important chiefly because of the wide study of his works in the early days of modern medicine. The latter also was a compiler and systematizer, but he was in addition an ardent though hardly successful man of research. His importance is again due to his writings which in later days became the highly valued text-books of the Arabian physicians and through them of European physicians till the days when the ancient medicine was supplanted by the results of modern research.

For more extensive study read:

Puschmann, T., History of Medical Instruction, 1891;
Sprengel-Rosenbaum, Geschichte der Medizin;
Neuberger, M., Geschichte der Medizin, 1906–08;
Schwalbe, E., Vorlesungen über die Geschichte der Medizin, 1909.

CHAPTER XVI

THE PHILOSOPHICAL SCHOOLS

1. Introductory.—Within the thousand years from 300 B. C. to 700 A. D. arose many philosophical parties or schools differing one from another in numerous ways in spite of the common tendencies that made them all legitimate offspring of the age. In the earlier centuries these differences between the rival philosophical tendencies are marked, but they become less evident as the general decadence proceeds and by the middle of the period have in large measure disappeared. Moreover, in the earlier centuries the schools of the golden age yet lingered on, for the Pythagoreans, the Socratics, the Platonists, the Aristotelians, the Ionians and the Eleatics were still distinguishable; but already these older schools were becoming more and more united by a common composite philosophy that may be called eclectic. In addition to these philosophical parties surviving from the preceding period there arose in the latter half of the fourth century three new and distinct philosophical schools, the Epicurean, the Stoic and the Skeptic. But in a few centuries these new schools also tend to merge into the same composite philosophy of the age and by the end of the early Roman Empire have quite disappeared as distinct parties. Thus as the centuries go by the philosophical thought of the Mediterranean world becomes more and more uniform, it becomes essentially religious, and it is best exemplified in the two great religious philosophies, the Neoplatonic and the Christian. In this chapter we shall study the two most promi-

nent schools arising in the Hellenistic period, the Epicurean and the Stoic, and the school that is peculiarly their successor in the Roman period, the Neoplatonic, leaving for the two following chapters respectively the study of Rome's great contribution to European thought, the Roman law, and the study of the Christian philosophy.

2. The philosophical schools of the Hellenistic and Roman periods.—The schools of the Hellenistic period were founded by their masters explicitly to meet a moral and religious need and therefore they may be called philosophical churches, not churches, however, for the masses, since the masses do not get their religion and philosophy from the great thinkers but from the general social environment and from the popular preachers. Rather these schools represented the intellectual aristocracy and were fitted for the moral and religious needs only of extraordinary men.

The Epicurean school aimed to free man from superstition and to teach man how to live in a world in which he has nothing to fear either before or after death. Since, according to Epicurus, man lives in a world of atoms governed only by mechanical laws and since such a world is neither moral nor immoral, neither divine nor diabolical; man has nothing to fear but man and nothing for which to hope except what man through his own free will and efforts is able to accomplish. If man will be thoroughly hard-headed and will seek the pleasures that endure, that are really worth while, and that are obtainable in every station of life; then man may live happily and die fearlessly. In contrast, the Stoic school aimed to make man believe in a divinely governed world, a world on which he might rest his hopes and to which he might completely entrust his life and its well-being. Nature is divine and the heavenly Father in whom we live and move and have our being rules all by His providence. All that happens

is of God, all came from God and will return to God. Therefore whether we live or die, whether we thrive or suffer, whether our lot is what the world calls easy or hard, we are God's and His will is working in us and is determining all for our good. Our part is but to believe in God and to live according to this belief. Our part is but to learn to desire that God's will be fulfilled in us, and to desire only what God desires. The Skeptic solved life's problem still differently. The wisest thing for man to learn is that he can know nothing, that science is impossible and that the world is therefore an insolvable problem. If man learns this he will base no hopes on the world and he will base no fears on the world. Rather he will harden himself to extreme indifference. Hope not, fear not, says the Skeptic, but so direct your life that you cannot lose and cannot have your peace of mind disturbed, your hopes unrealized or your happiness destroyed. In short, be indifferent.

Evidently such philosophies of life are only for the intellectually gifted and the self-directed. They betoken the existence still of intellectualism and individualism, and the existence still of the fight against the superstitions of the masses. But they bear also the marks of decadence and the loss of nerve; for they are evidently counsels of defence *against* the world. Their optimism is intended to inhibit or suppress a deeper pessimism. In their struggle against the popular religion and its prehistoric tendencies the Epicurean was most uncompromising and the Stoic least; but neither could win mankind, for neither really had anything to offer mankind that could bring back the old enthusiasm. That is to say, they fought superstition but this left their philosophy merely negative; and they defended man against a world of which he really despaired but this too left their philosophy merely negative. Now a negative belief cannot win the world; for to win the world one must needs teach what to love, what to hope, what to

do. Even savage hopes and loves and deeds are more stimulating and effective than the negative commands of the enlightened. Indeed, this truth is exemplified by these philosophical schools themselves; for they slowly died away or were gradually transformed into distinctly religious philosophies, approaching closer and closer the popular religion.

By the Christian era philosophy had become distinctly religious and the story of its further development is closely related to the history of the religions within the Roman Empire. This story is highly complicated, for each religious sect and movement had its theologians, teachers, or wise men; and as it is not within the scope of this book to give more than a general view of this remarkable period in Europe's intellectual history, let us single out the two most important and enduring philosophical movements, the philosophy called Neoplatonism and the Christian Philosophy. The two were closely related and the latter was much indebted to the former.

Neoplatonism arose at Alexandria in the third century after Christ out of earlier philosophical tendencies which date back three hundred years at least. This philosophical school is of especial interest to the student of philosophy; for it marks the bankruptcy of Greek science, by revealing the Greek thinker no longer interested in empirical and rational science but devoted to religion exclusively. The Neoplatonist distinguished three grades of wisdom, that which is empirically known, that which is known by the reason, and that which is super-rational, or super-scientific. Long before him Socrates and Plato had distinguished sharply between the world of perception and the world of science; and they had hinted at a yet higher emotional or ecstatic vision of the good, the true and the beautiful, the ultimate source of the forms. But they did not surrender as the object of their chief interest the two lower

worlds. This the Neoplatonist does, finding in God alone the true interest of the human mind. In distinguishing sharply between matter and form the Neoplatonist goes back also to Socrates, Plato and Aristotle. God is the source of all form, that is of all order and structure in the world; and, if we mean by a thing any object that has structure or character, then all things owe their existence ultimately to God. Above all other things our souls owe their being to God coming ultimately from Him; and they are restless until they are reunited with God, for the world of sense and reason cannot satisfy them and therefore cannot be the true object of their interest. Finally, God cannot be the object of our study in the way in which we study the material objects about us or in the way we study the objects of geometry. God is beyond science and therefore those who would see God or be reunited with Him must go beyond reason. But what is beyond reason? The Neoplatonists and the mystics of all ages have found this highest state of contemplation in the ecstatic vision, that is, in the trance produced by auto-suggestion.

The last great school of Mediterranean thinkers was composed of the fathers of the church from St. Paul to St. Augustine who gave the orthodox or catholic Christianity her theology. Whence was Christianity to derive her philosophy? The answer is twofold. On the one hand, the Jews had no philosophy of their own upon which Christianity could depend; but on the other hand, the Greeks had, and they alone had. In fact, the Jews before Christ had begun to absorb Greek thought, especially the Jews in Alexandria, that center of philosophy and meeting place of religions; and, as we have seen, by the time of Christ Greek philosophy had become the common possession of the Mediterranean world, had become genuinely the Mediterranean philosophy. Thus this Mediterranean philosophy had to form the intellectual environment of the Christian

from the days of Paul of Tarsus[1] to the days of Augustine, the converted student of Neoplatonism, and until there ceased to be any philosophical environment outside the Christian Church. In this Mediterranean environment the Christianity of the apostolic age changed both religiously and philosophically until by the fifth and sixth centuries it had become as truly the product of Mediterranean culture as it had begun the religion of Jesus' disciples gathered in Jerusalem. In short, the historian bids us think of historic Christianity as generically Mediterranean and only in some respects as specifically Judean. Indeed, it is only because the Church included the folk religion of the Mediterranean peoples that she survived the Dark Ages and has ever since controlled the religion of the southern and central European peasant. Hence if we mean by Christianity what the historian does, the actual religion of Europe from these days we are studying to our own, Christianity is far older in many of its elements than even historic Judaism. In part, it is as old even as the Mediterranean culture itself. Its philosophy in the broadest sense is therefore Mediterranean. However, we are now considering especially the philosophy of the great Christian thinkers. The source of this philosophy is twofold: first, the general thought of the intellectual Mediterranean world and Neoplatonism; and second, the Roman law. That is to say, the Christian thinker in philosophizing Christianity drew upon the legal concepts of the Greco-Roman and upon the concepts of the current philosophies. He drew in particular upon the Mediterranean conception of God, of the divine Mediator, of the world, of man's place in the world and of his relation to God and of God's relation to the world, of man's destiny

[1] Tarsus was a city of distinctly Hellenistic culture and a stronghold of Stoic philosophy with which St. Paul was undoubtedly familiar.

and of the ideal life, and finally of the way in which the soul came to be separated from God and of the means by which the soul can make its return to God. Christian theology was, of course, as were all the philosophies of the Roman period, a religious philosophy; and like the other philosophies of that period it added nothing to the sum of Greek science and contributed no radically new concepts, or principles to Greek philosophy.[1]

For further study read:

Paulsen, F. (Thilly transl.), System of Ethics, 1899, 33–64.

[1] The names of prominent thinkers of these several centuries from the time of Aristotle to the days of Neoplatonism are too numerous to be given in our outline. They can be found in the more detailed histories of philosophy. The Academy and the Lyceum long continued to number able men among their members. Among the Epicureans the most prominent names are: Epicurus, *fl. c.* 300 B. C.; and that of the Roman poet, Lucretius, *fl. c.* 60 B. C. Of the Stoics, the most prominent names are: Zeno, *fl. c.* 300 B. C.; Chrysippus, *fl. c.* 290 B. C.; the Roman, Panætius, *fl. c.* 140 B. C.; and in the days of the Empire, Seneca, *fl. c.* 40 A. D.; Epictetus, a contemporary of Seneca; and the emperor, Marcus Aurelius, *fl. c.* 160. Of the skeptics, the most prominent names are: Pyrrho, *fl. c.* 325 B. C.; Arcesilaus, of the Academy, *fl. c.* 275; Carneades, also of the Academy, *fl. c.* 175 B. C.; Ænesidemus, *fl. c.* 1 A. D.; and Sextus Empiricus, *fl. c.* 190 A. D. Of the so-called Eclectics, the following names are especially prominent: Posidonius, *fl. c.* 100 B. C.; the great Roman writer and statesman Cicero, *fl. c.* 60 B. C.; and Plutarch, *fl. c.* 100 A. D. There should be mentioned also the Jewish philosopher of Alexandria, a religious Platonist, Philo, *fl. c.* 10 A. D. Of the Neoplatonists the most prominent names are: Plotinus, *fl. c.* 250 A. D.; and Porphyry, *fl. c.* 275.

The transfer of Greek culture to Rome began with the conquest and annexation of the Greek cities of southern Italy and Sicily in the third century B. C. Cato the Censor, *fl. c.* 190 B. C., protests in vain against the introduction and influence of Greek culture and thought. By the time of Lucretius and Cicero, the Roman thinker has become as truly a Greek thinker as was any of his contemporaries. Among all Roman writers Cicero stands first for translating Greek thought into Latin.

3. The Epicurean school.—In the remainder of this chapter we shall study briefly the Epicurean, the Stoic and the Neoplatonic philosophies, leaving the study of Christian philosophy for a later chapter. Let us begin with the school founded by Epicurus [1] in Athens about 300 B. C.

Of all the Hellenistic schools the Epicurean had the least interest in science though it waged the keenest war against superstition. In fact, it was not a scientific society but a church. All Greek philosophical schools had been religious societies but they had been also schools of research; whereas this new school frankly renounced the scientific interest, for, according to the Epicurean, the only value of science is the practical value of freeing man from superstition and showing man what to live for. We may think of Epicurus as saying: "So far of course be scientific but no farther. Away with mathematics, astronomy and the rest as mere foolishness!" How different was the interest of the school as an ethical and religious society! As such it resembled in several respects the early Christian communities and was often associated with Christianity by its enemies. Like Christianity it bitterly opposed the folk religion and was accordingly numbered with the atheists and even persecuted. Like Christianity the Epicurean society was a sort of fraternity. Its poor and sick were cared for, it had its love feast, and its members were closely bound to one another by brotherly affection.

As a church the Epicurean society offered the world a

[1] Epicurus was born in Samos of Athenian ancestry in 341 B. C. He removed to Athens in 306 and died in 270 B. C. He was the founder of this school but it is doubtful if his teachings were original. He seems to have been indebted especially to his teacher Nausiphanes. None the less, he abuses Nausiphanes and all other older and contemporary philosophers.

way of life and made use of traditional philosophy only to defend and to establish "the faith." We have then two questions to put and to answer: What was the Epicurean faith? and, How did the Epicurean defend this faith philosophically? Let us first study the faith. Pleasure is the end of life. "Every pleasure is therefore a good on account of its own nature, but it does not follow that every pleasure is worthy of being chosen; just as every pain is an evil, and yet every pain must not be avoided. But it is right to estimate all these things by the measurement and view of what is suitable and unsuitable; for at times we may feel the good as an evil, and at times, on the contrary, we may feel the evil as good. And, we think contentment a great good, not in order that we may never have but a little, but in order that, if we have not much, we may make use of a little, being genuinely persuaded that those men enjoy luxury most completely who are the best able to do without it; and that everything which is natural is easily provided, and what is useless is not easily procured. And simple flavors give as much pleasure as costly fare, when everything that can give pain, and every feeling of want, is removed; and corn and water give the most extreme pleasure when any one in need eats them. To accustom one's self, therefore, to simple and inexpensive habits is a great ingredient in the perfecting of health, and makes a man free from hesitation with respect to the necessary uses of life. And when we, on certain occasions, fall in with more sumptuous fare it makes us in a better disposition towards it, and renders us fearless with respect to fortune. When, therefore, we say that pleasure is a chief good, we are not speaking of the pleasures of the debauched man, or those which lie in sensual enjoyment, as some think who are ignorant, and who do not entertain our opinions, or else interpret them perversely; but we mean the freedom of the body from pain, and of the soul

from confusion. For it is not continued drinkings and revels, or the enjoyment of female society, or feasts of fish and other such things, as a costly table supplies, that make life pleasant, but sober contemplation, which examines into the reasons for all choice and avoidance, and which puts to flight the vain opinions from which the greater part of the confusion arises which troubles the soul.

"Now, the beginning and the greatest good of all these things is prudence, on which account prudence is something more valuable than even philosophy, inasmuch as all the other virtues spring from it, teaching us that it is not possible to live pleasantly unless one also lives prudently and honorably and justly; and that one cannot live prudently and honestly and justly without living pleasantly; for the virtues are connate with living agreeably, and living agreeably is inseparable from the virtues. Since, who can you think better than that man who has holy opinions respecting the gods, and who is utterly fearless with respect to death, and who has properly contemplated the end of nature, and who comprehends that the chief good is easily perfected and easily provided; and the greatest evil lasts but a short period, and causes but brief pain. And who has no belief in necessity, which is set up by some as the mistress of all things, but he refers some things to fortune, some to ourselves, because necessity is an irresponsible power, and because he sees that fortune is unstable, while our own will is free; and this freedom constitutes, in our case, a responsibility which makes us encounter blame and praise." [1]

In other words, seek the pleasures that are sure to be within reach and that last. Then you have nothing to fear in heaven or in earth. Fortune cannot take such pleasures from you, for they are the kind that depend only

[1] Quoted from Epicurus by Diogenes Laertius, C. D. Yonge transl., pp. 471 f.

upon your own efforts and self-control. We are not the victims of chance or fate or blind necessity. The life of pleasure is in the reach of all prudent and thoughtful men, for its only conditions are foresight and free-will. The former we may have if we so choose and the latter is ours by nature. Moreover, we have no need to fear what the vulgar fear, the gods and death and the heavenly bodies. The gods are not what the vulgar conceive them to be, nor are the myths true of the gods. The gods have no need of human worship or magic offerings, nor are they moved by human wants and prayers. The gods are happy and immortal and such beings neither have evil happen to them nor cause evil to others and such beings are not moved either by hate or by anger. Rather the gods are in no way concerned with man and his lot and they dwell far away in the vast spaces where they are not subject to the destructive forces working in this corruptible world. Again there is nothing to fear in death, for death is the end of consciousness. "Death is nothing to us; for that which is dissolved is devoid of sensation, and that which is devoid of sensation is nothing to us." When we are alive death is not, and when we are dead we are not.

In defending this philosophy of life, the Epicurean found one general cosmological theory especially suited to his purpose, namely, that of Democritus. All is but a coming together and separation of atoms. The soul is such a collection of atoms and hence at death its atoms scatter and we are no more. Again, the phenomena of nature are nothing to be afraid of, because they are caused mechanically and not by supernatural or magical agents. But to this older cosmology the Epicurean had to make two radical amendments in the interest of his philosophy of life. First, in a world ruled by mechanical law there can be no freedom of the will, for each event is the result of necessity. This necessity is dogmatically denied, and our

wills are declared to be free and even the atoms are said to be somewhat free to move non-mechanically. Second, it was desirable to contradict the rationalism of the atomists who taught that the world of sensation is illusion and only the world of science is real. Whatever may have suggested to Epicurus his theory of knowledge, it is an extremely clever reconciliation of commonsense and the older rationalism. Things are what they seem to be, but the errors of sense-perception arise because things are also vastly more. What you and I see, is but one out of countless aspects of a thing, hence we err if we mistake one aspect for another or if we take one aspect for the entire nature of the thing.[1] These two amendments of the Democritic cosmology enabled the Epicurean to take the world as real much in the way commonsense judges it to be and to preach the commonsense doctrine that effort counts, that we can if we but will.

In short, be hard-headed, set aside superstitious fears, get rid of the terrors of death and of a life beyond death, take the world as you find it, count on your own effort and perseverance, live the happiest life you can, value the pleasures that last and that can be surely obtained, value friendship and be loyal to your fellows. Life is well worth while provided we rid it of human errors and truly take matters into our own hands. The chief errors are two, groundless and superstitious fears and a false valuation of what constitutes happiness.

[1] Consider this modern instance. One man sees an object as red and another is color blind and sees it as gray. Can an object be both red and gray in the same part and at the same instant? Yes, provided red is a compound of which gray is an element. That is to say, we who see the red, see the total color; but the color blind who sees the gray sees but an element in the red, still an element that is truly present. Now the color blind makes an error only in mistaking the color he sees for the entire color. In other words, the error is not, this object is gray, but is, this object is *only* gray.

For further study read:

Taylor, A. E., Epicurus, 1911;
Wallace, W., Epicureanism, 1880;
Hicks, R. D., Stoic and Epicurean, 1910;
Bakewell, Source Book in Ancient Philosophy, 290–316;
Diogenes Laertius, Lives and Opinions of Eminent Philosophers (Letters of Epicurus);
Lucretius (transl. Bailey), The Nature of Things, 1910;
Pater, W., Marius the Epicurean, 1892.

4. The Stoic school.[1]—In spite of the many common features that make both Epicurean and Stoic men of their age there is a marked contrast between the ways of life they preach to mankind. As we have seen: the Epicurean is hard-headed, asking nothing of the gods and needing only his free will and the attainability of happiness by the prudent. In contrast, the Stoic not only teaches man's dependence upon God but also urges man to trust in God completely, this trust being man's highest and ultimately only virtue. The Epicurean tells of a world ruled by mechanical forces and the chance configurations of atoms. The Stoic tells of a world guided in its transformations by Providence, a teleological world, and a world that is fundamentally and as a totality good. Here according to the Stoic is the secret of the higher life:—Live true to this faith in the divine providence, or world-reason. Desire only what God desires; call nothing really evil; fear nothing for all is of God; will what God wills.

Evidently if taken literally and practised faithfully this philosophy of life would end in moral paralysis. If all is good, nothing is evil; and if nothing is evil, what is there for the will to choose? Life becomes complete indifference

[1] The Stoic school was founded by Zeno of Citium in the island of Cyprus. He was according to tradition a Phœnician. He came to Athens in 314 B. C., studied under several philosophers and founded his own school in 294.

and inaction. But the Stoic did not take his doctrine literally.[1] The will has something to do. Man has evil to fight. Good and bad are distinct and it is important not to confuse the two. But what is good? What God does as opposed to what man does. Put into other words, nature's ways are good, and if man will but be truly natural he will be good. But again a question arises: What is natural? The answer is not new. As Socrates and his successors found forms in the world of the lifeless and the living, so does the Stoic. Thus, the problem quickly reduces to ascertaining what is the "form" of man and this is quickly ascertained if we contrast man and brutes. Brutes are ruled entirely by instinct, but man is endowed with reason. Man is hereby made in the image of God, for God is reason. Therefore to live the life true to nature is to be rational, is to live guided not by instinct but solely by reason. Admirable as this sounds, it still leaves one puzzled what actually to do in the crises of life. Reason can sit as judge between rival tendencies but how shall it decide. Actions do not come branded as rational or natural, for to be rational merely means to be judicial and to decide without bias which side one should take. But to take sides one has to know the law, and to render rational decisions one has to be guided by principles. Therefore, to tell men to be rational and to leave them ignorant of how to judge between rival deeds or to harmonize conflicting tendencies is to leave them morally helpless. In short, the Stoic is forced to get back to the position of commonsense and find objective good and evil.

[1] Men can do evil though God can counteract their doings and keep His universe as a whole good. This is a favorite religious and philosophical hypothesis of the mystics. The world *as a whole* is good, though the parts are often evil; or the evil may even be essential to the perfection of the whole, as the shadows are essential to the beauty of a painting.

Some deeds are inherently good and some inherently bad, or some deeds are to be preferred to others. And when the Stoic comes to decide which is which, we find him to be of the same mind as the other noble characters of his age. That is, the age and not the Stoic makes the Stoic morality. But it is important to press the question further. How is one to distinguish the good from the bad? The answer given by the Stoic is: The universal belief of man, the *consensus gentium* will tell. The Stoic puts it also, mankind has inborn information in the sense that there are born in man faculties of judging infallibly and these faculties will intuitively tell what is good and bad. That is to say, there is no principle by which the good is to be defined as distinct from the bad, for the limit of analysis is reached before such a principle is given. The ultimate fact is that man can intuitively decide whether this is good or that is bad; but why this is good or that is bad, he cannot tell. Here the Stoic seems philosophically inferior to the Epicurean with his doctrine that pleasure is good and pain is evil.

Let us turn from these particular problems and consider Stoicism in general as one of "the ways of life" offered to man in these remarkable centuries. Needless to say, Stoicism was, as was Epicureanism, an effort of the man of insight and of self-control to adjust himself to the spiritual and political world of those days; and it was a noble effort. Needless also is it to add, Stoicism was a true offspring of the Hellenistic age. What we should rather consider is the specific part this philosophy played. It held out to man an ideal that none could realize, but that some men could at least approach. As a consequence, Stoicism has been famous in all the centuries since for the remarkable characters it produced. Again, Stoicism was a religion only for the extremely intellectual and could never become the religion of the folk; and, as a consequence, it seems to

have been almost without influence upon the popular religions. Finally, Stoicism was peculiarly suited to the rigorous morals of republican Rome and was therefore especially successful in competing with its rivals for the approval of the great Romans; and certainly two of its greatest triumphs were the influence it exerted upon the Roman law through the great Roman jurists who had absorbed its moral principles, and the influence it exerted upon Roman statesmen.

In contrast with Epicureanism Stoicism comes closer to being true to the age in its asceticism and in its compromise with the superstitions, ritual and magic of the people. In contrast with Christianity it seems cold and hard-hearted. The Stoic might relieve a brother's distress or go to the aid of the unfortunate, but he did so as a rational moralist and not as a fellow sympathizer. Pity and love of the brethren seemed to him weakness and a danger to his philosophical peace of mind. "The Wise Man was not to *concern* himself with his brethren, he was only to serve them." Thus the Stoic morality was rationalism purged of emotion and sentiment; and as such it was as truly pathological in its extreme as was the life it condemned, the life of luxury and debauchery at the other extreme.

Typical of the age the Stoic preached his philosophy as did the Epicurean; and this meant that he was a prophet rather than a scientist. Yet he too needed a philosophy in this enlightened age to persuade the learned and to refute the rival. It is interesting to see whither he went to get his philosophical apology, for genuine philosophical invention was becoming rapidly a thing of the past. He did not go to the followers of Plato and Aristotle but back to Heracleitus, as the Epicurean went to Democritus. The ultimate stuff of the world is an ever living and thinking fire. Part of this divine fire is the soul, the vital principle and the reason in man. Of this living matter all

things are made but in most things it is debased by having become earth, water, air and mist; whereas in man's soul, in the heavenly world and in the divine formative agents, or seeds working throughout nature and controlling nature's development it is pure and genuinely divine. All things have come from this divine *physis* and in time all things will return being burnt up in the world conflagration. In turn, world generation will follow anew and the divine fire will transform into the same world again. Thus cosmical history is a repetition of the same world, is cyclical. As in the older Ionic cosmologies the *physis* is both matter and god, is both living and thinking; so the Stoic identifies this divine fire with God and with the forms and the formative agents that make the world a cosmos. Working throughout the world it is Providence, the *logos*, the divine intermediary between the ultimate God and the world. Thus the doctrine of Heracleitus is easily adapted to justify the Stoic's belief in Providence and in the goodness of all the world.[1]

For further study read:

Murray, G., The Stoic Philosophy, 1915;
Bevan, E., Stoics and Sceptics, 1913;
Hicks, R. D., Stoic and Epicurean, 1910;
Bakewell, Source Book in Ancient Philosophy, 269–289, 317–339.

For more extensive study read:

Arnold, E. V., Roman Stoicism, 1911;
Seneca, On Benefits;
Epictetus, Golden Sayings;
Marcus Aurelius, Thoughts.

5. Neoplatonism.—In the third and second centuries before Christ marked differences between the several phil-

[1] The Stoics made important contributions to logic, grammar and the theory of knowledge.

osophical schools continued to exist and these schools remained predominantly Greek. By the beginning of the first century, however, the drift toward eclecticism and toward cosmopolitanism was bringing them closer and closer together and closer to Oriental ways of thinking.[1] This drift was away from the naturalism of the older Stoics and toward Plato and the Pythagoreans. This drift toward Pythagoreanism is to be seen especially in two doctrines. First, the soul is a distinct sort of stuff from the physical world, and its imprisonment in the body is an exile from its true home and a source of defilement. Therefore, the true work of the moral life is not, as the Stoic taught, to rationalize life freeing it from the instincts and emotions, but to purge the soul of the flesh, to rid it of defilement, to save the soul. Second, the Stoic had taught that nature is all one and divine as the Ionians had taught long before; but now the eclectic philosopher returns to the dualism of the Pythagorean, the dualism ultimately between form and matter. The material world is evil and is not of God. God is pure form and the source of order in the world. Thus the whole drama of life is centered about the return of the world to God. Moreover, this dualism is not a problem merely of thought; for the heavenly world is visible. We behold it as we look up at the blue sky and the stars. There we literally see the divine world, the true home of the soul, the land of spirits, the place to which the pure souls will ascend when freed from the body.

[1] The most prominent and seemingly the most influential leader in this movement was Posidonius (*fl. c.* 100 B. C.). Following him and possibly greatly indebted to him was the famous Jewish philosopher of Alexandria, Philo, who endeavored to combine Platonism, Judaism and other Oriental religious doctrines. Philo flourished about 10 A. D. Finally in Rome the great Roman statesman and writer Cicero (*fl. c.* 60 B. C.), probably following the writings of Posidonius, does for Italy what Posidonius did for the eastern Greek Mediterranean world.

There the souls spend their time "watching the stars go round. This to us might not seem an occupation of ever-fresh interest, but the idea of it apparently suggested the perfection of bliss to the men of those days."

This eclecticism is the beginning of a movement that by the third century after Christ gave rise in Alexandria to a philosophical school which combines the Greek and the Oriental philosophies and therewith brings ancient Mediterranean thought to one of its final stages. Thus precisely as in these days the emperors were bringing ancient political history to its final stage by transforming the Roman empire into a universal state "bearing the cast of Oriental as well as Greco-Roman civilization," so was this school of thought combining the ancient wisdom into a universal philosophy. This universal philosophy based on all preceding Greek thought and combining both Greek and Oriental culture is called Neoplatonism.[1] "Just as the later Roman Empire was at once the supreme effort of the old world and the outcome of its exhaustion, so Neoplatonism is in one aspect the consummation, in another the collapse, of ancient philosophy. Never before in Greek or in Roman speculation had the consciousness of man's dignity and superiority to nature found such adequate expression; never before had real science and pure knowledge been so undervalued and despised by the leaders of culture as they were by the Neoplatonists. Judged from the standpoint of empirical science, philosophy passed its meridian in Plato and Aristotle, declined in the post-Aristotelian systems, and set in the darkness of Neoplatonism. But, from the religious and moral point of view, it must be admitted that the ethical 'mood'

[1] Its reputed founder was Ammonius Saccas (*fl. c.* 215 A. D.). Its greatest systematists were Plotinus (*fl. c.* 250 A. D.) and his pupil Porphyry (*fl. c.* 275 A. D.). In my account of Neoplatonism I am indebted especially to Harnack's writings.

which Neoplatonism endeavored to create and maintain is the highest and purest ever reached by antiquity." [1] That is to say, in Neoplatonism Greek science goes bankrupt in a religious idealism which renounces all interest in the world and which despairs of man's efforts to understand and to master this world, in an idealism which put faithfully and universally into practice would lead directly back to savagedom. Here unite Oriental thought and the religion of the Orphic worked out completely as a philosophy. Indeed, one may say that Greek philosophy ended, as it began in the West, an Orphic religion, and thus that this ancient Orphic conception of the world was never outgrown and discarded by the Mediterranean civilization. Briefly put, Neoplatonism as such contributed nothing to the scientific development of Europe, though it did carry within it to later generations some older Greek learning and traditions. Neoplatonism belongs rather to the history of European religion.

Perhaps the clearest evidence of this non-scientific character is to be seen in its aforementioned belief and interest in the super-rational. Neoplatonism gives up two worlds in despair, the world of commonsense and the world of science, the world of sense-perception and the world of reason. By giving them up in despair I mean four things: first, that man fails to master these worlds by understanding them; second, that man cannot but fail, if he pursues the methods of commonsense and of science; third, that the world cannot be understood in terms of itself, that things are not to be taken literally, that they are not what they seem but are an allegory; and fourth, that this world is not important relatively to another world, that it is not man's true home and normal environment but that the important world is above the moon. Now if life in this world below the moon is to be inter-

[1] Harnack, art. Neoplatonism, Encycl. Brit., 11th ed.

preted in terms of a world other than the world of science and daily life, a superworld, it must be apprehended by methods of a radically different kind from those of science. It must be studied by faculties other than sense-perception and reason. The methods of apprehension are two: first, revelation coming from the superworld, and second, the winning of the heavenly vision through the escape of the soul from its worldly environment and from the flesh. Both these ways were followed by the Neoplatonist in common with the religious world of his age. On the one hand, he longed for a revelation from God and either constantly expected the coming of such a revelation or believed that it had already come, for example, in the ages past to the mysterious prophets of the far East. And this longing could be generalized into the doctrine that everything about him and all of past history were filled with messages from God. On the other hand, the Neoplatonist longed for the heavenly vision and struggled to gain it. This ecstatic vision is a mental condition that ancient psychology by no means understood and that modern psychology understands only in part. The whole subject belongs to the field of suggestion, hypnosis, auto-suggestion, dissociation, trance, hysteria and other forms of abnormal mental life. I have called it the super-rational. The way thereto is fasting and prayer, or long meditation, or whatever can cause auto-hypnosis. In this condition the heavens open and the divine mysteries are uncovered, things are seen that no tongue can describe and that the mind of man cannot comprehend.

Let not the student, however, judge from this that the experiences of the mystic are not to be respected. The mystic insight like the poetic insight has not only its right to be heard but also its unique message of great import. The mystics have given Europe her great spiritual and devotional classics and have profoundly enriched the

spiritual life of the western world. Man has needs and longings that cannot be satisfied by science; and the days of the late Roman Empire were a time in which these longings were most intense, and in which the great minds were devoted to meeting a particular spiritual need, a time in which men cried aloud to God with St. Augustine: "Thou madest us for Thyself, and our heart is restless, until it repose in Thee." Man cannot live by bread alone. But, as Harnack has said, men knew this before Neoplatonism. The deeper truth that Neoplatonism added and enforced was: Man cannot live by knowledge alone.

Here the pertinent question arises: Why did not Neoplatonism succeed in giving the Roman world a universal religion, why did it fail to do what Christianity succeeded in doing? The answer is, it was a religion of the philosophically minded and not a folk religion. It asked the people to live a life of reflection and asceticism beyond their powers. It did not give them a view of God and heaven that was concrete enough. Its worship was a mood or an emotional state that was not directed toward concrete objects such as the folk will persist in worshipping. It lacked a great personal founder and his personality; and even with the patronage of the Roman emperor, Julian, it failed to excite the respect and obedience of the people.

The most genuinely philosophical of the leaders of the Neoplatonic movement was Plotinus. After Plotinus Neoplatonism declined steadily toward the religion and theology of the masses. Accordingly let us study briefly Plotinus' philosophy. His doctrine is of course mysticism and typical of mysticism has two parts, a theoretical part and a practical part. The theoretical part explains the origin and the nature of the soul and its departure from its first estate. The practical part tells how the soul may make its way back to that first estate. To explain the origin of the soul requires Plotinus to give us a general

theory of the world. There are three levels to reality that are prominent even as we casually look at the world and these were especially prominent to the ancient thinker. Below us is the world of lifeless material things, then next the world of living things and especially of man and his mind, third is what we often call the laws of nature which man's mind discovers and regards as the proper object of science. But is there not some higher level beyond and behind these laws? Yes, God is behind them. So there is a fourth level. Plotinus endeavored in the notions of his age to show men the character of this world of the four levels. First is God or the ultimate being. He is beyond the laws of nature, the subject-matter of science; therefore He cannot be described in the terms of science, or rational thought. He is super-rational, which means that every possible concept that we use to define Him fails. Even the word "exist" is inadequate. God is beyond all that is denoted by such words as good, exist, and infinite. The same inadequacy is present in calling Him the creator, for creation is a process beyond science and beyond even the notion named process. Thus the world came from God, but in a way we cannot conceive. Its creation cost God nothing for it comes perpetually from God without altering God, without His moving and without the force in the Godhead diminishing. The first thing that came from God was the second level, the laws of nature, that is, the world of the reason. From this in turn came the third level, a level between the world of material objects and the laws of nature, or, to use Plotinus' term, soul. Thus came the souls of men which make them capable of dealing with the things of the reason on the one hand and the material things on the other hand; and thus came the world-soul, the great power that in the ordinary sense is the world-creator. The world-soul was needed, we may say, to get the laws of nature incarnated in the material

world so that it would no longer be a world of formless, qualityless, characterless matter but the world of form and order, the world of things, the cosmos. All then ultimately has come from God; but intervening between God and the lowest level are these two necessary orders of being, the laws or forms and the souls. Coming from God, the world is good and its so-called evil is a necessary element which amounts simply to a negative characteristic to be identified with formless matter. Matter, the ultimate neutral characterless stuff, does not get perfectly formed and so its evil or imperfection is precisely this absence of perfection. Or put in other words, as we descend through the levels from God we pass farther from God and the divine is present in the world to a less and less degree. In still other words, the world is a scale from the ineffable Godhead to the material world about us, in which the divine gradually decreases from infinity to zero. Finally, in this world that owes its existence or form to the ultimate being is a tendency to return whence it has come, a longing for the heavenly home.

This introduces the practical philosophy, or the way back to God. It is a matter of retracing our steps, and as there have been stages away from God so there are stages back to God. These stages are an interesting index of the spiritual and moral life of the age. First, and lowest, is the life of the good citizen, the civil virtues; but these do not purify the soul. Second, are the virtues that free the soul from sensuality and lead it back from the material world to the world of science, to spirituality. These virtues are attained by the ascetic life. But it is not enough to become spiritual and to be free from matter or sin, for there is a still higher stage than the reason, there is God. Third, then, is the highest stage, man is to become God. This stage is to be reached through the contemplative study of God, not by science or reason, which will carry us

no farther than to the forms, but by super-rational contemplation and ecstasy through which the soul quite escapes from all but its divine nature. In short, the soul must "pass through a spiritual curriculum. Beginning with the contemplation of corporeal things in their multiplicity and harmony, it then retires upon itself and withdraws into the depths of its own being, rising thence to the reason, *nous*, the world of ideas. But even there it does not find the Highest, the One; it still hears a voice saying, 'not we have made ourselves.' The last stage is reached when, in the highest tension and concentration, beholding in silence and utter forgetfulness of all things, it is able as it were to lose itself. Then it may see God, the fountain of life, the source of being, the origin of all good, the root of the soul. In that moment it enjoys the highest indescribable bliss; it is as it were swallowed up of divinity, bathed in the light of eternity." [1] We are told that Plotinus attained to this ecstatic union with God at least four times.

Here we behold a way of life not peculiar to this one school but to the age and long after the age to medieval Christianity, a way of life in which the thing of supreme value is the *vita contemplativa*, the life of prayer and meditation about heavenly things, and the mystic vision of the ecstatic saint. According to this philosophy of life man is not of this world but of another world and the supreme enterprise of his life is to get back to the world to which he belongs. To be virtuous is not to be a good and efficient citizen, for that is but to take the first step and therefore to take one liable to be thought lightly of. The highest virtue is rather to crucify the flesh and to rise freed from the body into a world that passes human understanding.

These three schools, the Epicurean, the Stoic and the

[1] Harnack, *ibid.*

Neoplatonic, each endeavored to give the intellectual man a way of life. The two earlier schools evidently formed a transitional stage to the last, and even in the days of their greatest prosperity had to struggle against religious influences which indicated whither the thought of the Mediterranean world was tending ever more strongly. They themselves soon disappeared in the general eclecticism of the first century before and after Christ and this eclectic philosophy kept moving in the direction to be represented in the end by the later Hellenistic-Oriental religions of the Roman Empire, by Neoplatonism and by Christianity.

For further study read:

Encycl. Brit., 11th ed., art. Neoplatonism;
Bakewell, Source Book in Ancient Philosophy, 340–393;
Dill, S., Roman Society in the Last Century of the Western Empire, 2d ed., 1899, Books I, II and V.

For more extensive study read:

Whittaker, T., The Neoplatonists, 1901;
Harnack, A., History of Dogma, 1899 (Appendix on Neoplatonism);
Dill, S., Roman Society from Nero to Marcus Aurelius, 2d ed., 1905;
Inge, W. R., Christian Mysticism, 1899.

CHAPTER XVII

THE ROMAN LAW

1. Introductory.—Thus far it has been possible to record the history of ancient thought without studying the part played by Rome; and this has been possible, because Rome contributed virtually nothing to those branches of science which we have considered. To another branch of ancient thought, however, to legal science, Rome did contribute pre-eminently. In fact, Rome rendered two chief services in the intellectual development of Europe. First, Rome received and assimilated many elements of Hellenistic culture; and much of what she assimilated, she carried to the distant provinces of the West and North. Thus northern Italy, Gaul, Britain, Spain and Northern Africa were receiving a Greco-Roman culture during the last days of the Republic and during the centuries of Imperial Rome until the Roman church succeeded the Roman people as the teacher of the Western world. Second, through one of the greatest achievements of man's intellect, the Roman private law, Rome gave both the ancient and the modern world an enduring legal philosophy.

2. The entrance of Hellenic culture into Rome.—As Rome became mistress of southern Italy and developed into a great commercial center with its foreign population she began to meet Greek culture. Later as she became mistress of Greece and of the remnants of the Alexandrine empire she became also a resort of Greek teachers and not many decades later she herself was sending her own

gifted youth to the philosophical schools of the East. At first, the constitutionally conservative and provincial Roman despised the foreign learning and refinement; but gradually "conquered Greece conquered her conqueror," and by the closing years of the Republic Greek philosophy had become an indispensable part of the higher culture of the intellectual Roman.

However, "the Roman thinkers never produced an independent system of thought; they were eclectics, taking from different systems what most appealed to them. Even when they accepted a system as a whole, they modified it to suit their taste. They had no patience with subtleties, sophistries and paradoxes, and avoided the hair-splittings and fine distinctions in which the Greeks reveled; nor were they fond of controversies and disputations. They were not profound thinkers, but were governed by commonsense; 'they sought and found in philosophy nothing but a rule of conduct and a means of government.'" [1]

For further study read:

Duff, J. W., A Literary History of Rome, 1909, 18–38, 92–117, 349–397;

Fowler, W. W., The Religious Experience of the Roman People, 1911, 357–472;

Cicero, On the Nature of the Gods.

For more extensive study read:

Fowler, W. W., Social Life at Rome, 1909;

Dill, S., Roman Society from Nero to Marcus Aurelius;

Fowler, W. W., Rome (Home University Library).

3. The development of the Roman private law.—The earliest form to which scholars can trace the Roman private law is a body of customs such as one finds among any barbaric people. On the one hand, it is largely a mat-

[1] Thilly, History of Philosophy, pp. 119 f.

ter of custom between clans and families in an agricultural and patriarchal people with the individual as yet not a legal person. On the other hand, it is largely a matter of ritual with the implicit legal principle as yet hardly perceived. In the course of its earlier development both of these aspects were held to tenaciously and they disappeared almost entirely only after centuries of development. By that time the Roman law had become a simple, harmonious, highly enlightened and explicit body of legal procedure and principles, a system of laws fitted to be the legal guide of the mightiest of empires populated by many and various peoples and to be later the legal guide and the source of legal inspiration to modern Europe. That the ancient customs and ritual of the Roman families and clans became the Roman law of the Empire was due to a group of happy circumstances; for it was not the result of foresight but the result of a genius to rule compelled to solve complex political and social problems one after another through centuries.

The original Roman law, the Quiritary law, *jus Quiritium*, or *jus civile*, was the law solely of the Roman people, the later patricians. It was strictly a law between families with its famous *patria potestas* making the head of the family the only legal person and leaving him supreme over all matters belonging strictly within the family. Thus, doubtless, the Roman law might have remained, had not Rome become the home of more and more numerous foreigners, the plebeians. These foreigners came to Rome as members of states now under Roman hegemony, they came to Rome as the safest home of trade and industry, and they came as merchants from distant lands with whom Rome had treaties of trade. At first Rome could leave them to their own customs and usages; but as their number increased, as their business relations with Romans became more complex, as they became permanent resi-

dents, as they became land-owners and finally as they became a necessary military asset, the Roman state had to assume legal jurisdiction over them. Moreover, these plebeians were not themselves passive, but as is usual with a powerful alien population began to struggle for and to gain for themselves political and legal rights. In short, a large part of the history of the Roman Republic for centuries is composed of the struggles abroad with foreign states and of the struggles at home between patrician and plebeian.

Compelled to face this complex problem and with the native capacity to solve it, Rome, in the person of her *prætor peregrinus* and behind him of her students of the law, the jurisconsults, of whom the prætor holding his office for but a year was in fact merely a representative, brought gradually into existence the *jus gentium*. As this *jus gentium* developed and as the plebeians and Italians became Roman citizens the new law tended to supplant the older law and to become in fact the common law of the Roman people.

May I quote at length from Maine's admirable description of this development? "The most superficial student of Roman history must be struck by the extraordinary degree in which the fortunes of the republic were affected by the presence of foreigners, under different names, on her soil. The causes of this immigration are discernible enough at a later period, for we can readily understand why men of all races should flock to the mistress of the world; but the same phenomenon of a large population of foreigners and denizens meets us in the very earliest records of the Roman State. . . . Whatever were the circumstances to which it was attributable, the foreign element in the commonwealth determined the whole course of Roman history, which, at all its stages, is little more than a narrative of conflicts between a stubborn national-

ity and an alien population. . . . In the early Roman republic the principle of the absolute exclusion of foreigners pervaded the civil law no less than the constitution. The alien or denizen could have no share in any institution supposed to be coeval with the state. He could not have benefit of Quiritarian law. . . . Probably half as a measure of police and half in furtherance of commerce jurisdiction was first assumed in disputes to which the parties were either foreigners or a native and a foreigner. The assumption of such a jurisdiction brought with it the immediate necessity of discovering some principles on which the questions to be adjudicated upon could be settled, and the principles applied to this object by the Roman lawyers were eminently characteristic of the time. They refused to decide the new cases by pure Roman civil law. They refused to apply the law of the particular state from which the foreign litigant came. The expedient to which they resorted was that of selecting the rules of law common to Rome and to the different Italian communities in which the immigrants were born. In other words, they set themselves to form a system answering to the primitive and literal meaning of *jus gentium*, that is, law common to all nations. *Jus gentium* was, in fact, the sum of the common ingredients in the customs of the old Italian tribes, for they were *all the nations* whom the Romans had the means of observing, and who sent successive swarms of immigrants to Roman soil. Whenever a particular usage was seen to be practised by a large number of separate races in common it was set down as part of the law common to all nations, or *jus gentium*. . . .

"The circumstances of the origin of the *jus gentium* are probably a sufficient safeguard against the mistake of supposing that the Roman lawyers had any special respect for it. It was the fruit in part of their disdain for all foreign law, and in part of their disinclination to give the

foreigner the advantage of their own indigenous *jus civile.* It is true that we, at the present day, should probably take a very different view of the *jus gentium,* if we were performing the operation which was effected by the Roman jurisconsults. We should attach some vague superiority or precedence to the element which we had thus discerned underlying and pervading as great a variety of usage. We should have a sort of respect for rules and principles so universal. . . . But the results to which modern ideas conduct the observer are, as nearly as possible, the reverse of those which were instinctively brought home to the primitive Roman. . . . The parts of jurisprudence which he looked upon with affection were exactly those which a modern theorist leaves out of consideration as accidental and transitory; the solemn gestures of the mancipation; the nicely adjusted questions and answers of the verbal contract; the endless formalities of pleading and procedure. The *jus gentium* was merely a system forced on his attention by a political necessity. He loved it as little as he loved the foreigners from whose institutions it was derived and for whose benefit it was intended. A complete revolution in his ideas was required before it could challenge his respect, but so complete was it when it did occur, that the true reason why our modern estimate of the *jus gentium* differs from that which has just been described, is that both modern jurisprudence and modern philosophy have inherited the matured views of the later jurisconsults on this subject. There did come a time when, from an ignoble appendage of the *jus civile,* the *jus gentium* came to be considered a great though as yet imperfectly developed model to which all law ought as far as possible to conform. This crisis arrived when the Greek theory of a law of nature was applied to the practical Roman administration of the law common to all nations."

As has been mentioned the official instrument through

which all of this was brought about was the *prætor perigrinus*. Now it was a precautionary custom of the Roman people to oblige "every magistrate whose duties had any tendency to expand their sphere, to publish, on commencing his year of office, an edict or proclamation, in which he declared the manner in which he intended to administer his department. The prætor fell under the rule with other magistrates; but as it was necessarily impossible to construct each year a separate system of principles, he seems to have regularly republished his predecessor's edict with such additions and changes as the exigency of the moment or his own views of the law compelled him to introduce. The prætor's proclamation, thus lengthened by a new portion every year, obtained the name of the *edictum perpetuum*, that is, the *continuous or unbroken* edict. The immense length to which it extended, together perhaps with some distaste for its necessarily disorderly texture, caused the practice of increasing it to be stopped in the year of Salvius Julianus, who occupied the magistracy in the reign of the emperor Hadrian. The edict of that prætor embraced therefore the whole body of equity jurisprudence, which it probably disposed in new and symmetrical order, and the perpetual edict is therefore often cited in Roman law as the Edict of Julianus.

"What were the limitations by which these extensive powers of the prætor were restrained? How was authority so little definite to be reconciled with a settled condition of society and law? . . . The prætor was a jurisconsult himself, or a person entirely in the hands of advisers who were jurisconsults, and it is probable that every Roman lawyer waited impatiently for the time when he should fill or control the great judicial magistracy. In the interval, his tastes, feelings, prejudices, and degree of enlightenment were inevitably those of his own order, and the

qualifications which he ultimately brought to office were those which he had acquired in the practice and study of his profession. . . .

"The nature of the measures attributed to Salvius Julianus has been much disputed. Whatever they were, their effects on the Edict are sufficiently plain. It ceased to be extended by annual additions, and henceforward the equity jurisprudence of Rome was developed by the labours of a succession of great jurisconsults who fill with their writings the interval between the reign of Hadrian and the reign of Alexander Severus. A fragment of the wonderful system which they built up survives in the Pandects of Justinian, and supplies evidence that their works took the form of treatises on all parts of Roman law, but chiefly that of commentaries on the Edict. . . .

"The period of jurists ends with Alexander Severus. From Hadrian to that emperor the improvement of law was carried on, as it is at the present moment in most continental countries, partly by approved commentaries and partly by direct legislation. But in the reign of Alexander Severus the power of growth in Roman equity seems to be exhausted, and the succession of jurisconsults comes to a close. The remaining history of the Roman law is the history of the imperial constitutions, and, at the last, of attempts to codify what had now become the unwieldy body of Roman jurisprudences. We have the latest and most celebrated experiment of this kind in the *Corpus Juris* of Justinian." [1]

4. The jus naturale.—"The *jus naturale*, or law of nature, is simply the *jus gentium* or law common to nations seen in the light of a peculiar theory." This theory is the law of nature that we have met in the doctrine of the Stoics and which had a long history in the earlier periods of Greek thought. In short, *in the law of nature Roman*

[1] Maine, Ancient Law, Chap. III.

legal thought and Greek ethical thought meet. Of the Hellenistic philosophies that began to make their way to Rome as early as the second century before Christ Stoicism was the most easily welcomed. From the first century before Christ through the era of the Antonine Cæsars when Roman Stoicism had its most famous disciples and through the very era when Roman equity was reaching its highest stage of development there was almost an alliance between the Roman lawyers and the Roman Stoic philosophers. This does not imply that legal rules were derived from Stoic doctrine; but it indicates the spirit behind the work of the jurist and the power that helped him to emancipate himself from the older legal tradition and to simplify and to generalize the Roman law into the *jus gentium.*[1] Again the idea of the law of nature gave to the *jus gentium* all the "prestige of philosophical authority" and associated it with the ideal state of man, believed by the philosopher to be the life in accord with nature. In a sentence, the influence of Hellenistic philosophy upon Roman law was "that the spirit of critical enquiry aroused and fostered by literary and philosophical study, seriously and conscientiously undertaken, contributed greatly to promote a new departure in jurisprudence that became very marked in the time of Cicero—the desire to subordinate form to substance, the word spoken to the will it was meant to manifest, the abstract rule to the individual case to which it was proposed to apply it." However, the *jus naturale* and the *jus gentium* must not be identified. The former was a philosophical principle, a general ethical

[1] "The ideas of simplification and generalization had always been associated with the conception of nature; simplicity, symmetry, and intelligibility came therefore to be regarded as the characteristic of a good legal system, and the taste for involved language, multiplied ceremonials, and useless difficulties disappeared altogether." The quotations in this section are from Goudy, art. "Roman Law," Encycl. Brit., 11th ed.

attitude, an ideal. Its influence upon the law was by its spirit rather than by any incorporation of its specific principles.[1] In other words, the point of contact between the old *jus gentium* and the law of nature was equity, and equity meant the constant levelling or removing of irregularities and the eliminating of a multitude of arbitrary distinctions between classes of men and kinds of property

[1] "Voigt thus summarizes the characteristics of this speculative Roman *jus naturale:*—(1) its potential universal applicability to all men, (2) among all peoples, (3) at all times, and (4) its correspondence with the innate conviction of right. Its propositions, as gathered from the pages of the jurists of the period, he formulates thus:—(1) recognition of the claims of blood; (2) duty of faithfulness to engagements; (3) apportionment of advantage and disadvantage, gain and loss, according to the standard of equity; (4) supremacy of the *voluntatis ratio* over the words or form in which the will is manifested."

"It was regard for the first that, probably pretty early in the principate, led the prætors to place emancipated children on a footing of equality with unemancipated in the matter of succession, and to admit to succession collateral kindred through females as well as those related through males; and that, in the reigns of Hadrian and Marcus Aurelius respectively, induced the senate to give a mother a preferred right of succession to her children, and *vice versa*. It was respect for the second that led to the recognition of the validity of what was called a natural obligation,—one that, because of some defect of form or something peculiar in the position of the parties, was ignored by the *jus civile* and incapable of being made the ground of an action for its enforcement, yet might be given effect to indirectly by other equitable remedies. Regard for the third was nothing new in the jurisprudence of the period; the Republic had already admitted as a principle that a man was not to be unjustifiably enriched at another's cost; the jurists of the empire, however, gave it a wider application than before, and used it as a key to the solution of many a difficult question in the domain of the law of contract. As for the fourth, it was one that had to be applied with delicacy; for the *voluntas* could not in equity be preferred to its manifestation to the prejudice of other parties who in good faith had acted upon the latter. We have many evidences of the skilful way in which the matter was handled, speculative opinion being held in check by considerations of individual interest and general utility."

recognized by the old *jus civile*. Thus equity meant simplifying and generalizing the law.

Yet right here lay one of the greatest dangers to which the Roman jurist was exposed, a danger that the Greek thinker did not escape, but that the Roman did. The Greek was essentially a theorist but the Roman was what in our day is called a pragmatist. The Greek generalized the law so that it became a mere general ethical ideal that threw little light on the complex problem of litigation and justice between man and man; whereas the Roman lawyer never lost sight of the complex problem and in laying down his ideals never set aside the concrete rules of the law.[1] Rather he sought the ideal precisely in these concrete and multitudinous specific cases of rights and obligations. Had he not done so, the Roman law could never have become the legal guide of Europe then and in the centuries to come but would have been as uninfluential as the noble but impractical idealism of the Stoic creed. The cause of this difference between Greek and Roman, apart from national temperament, was perhaps, on the one hand, the rapidity with which the Greek passed from the barbaric law of the past to the Greek constitutions and morals of the golden age, and, on the other hand, the

[1] "A remark of Voigt's on the subject is well worthy of being kept in view, that the risk which arose from the setting up of the precepts of a speculative *jus naturale*, as derogating from the rules of the *jus civile*, was greatly diminished through the position held by the jurists of the early Empire. Their *jus respondendi* made them in a sense legislative organs of the state, so that, in introducing principles of the *jus naturale*, or of *æquum et bonum*, they at the same moment defined them and gave them the force of law. They were, he says, 'philosophers in the sphere of law, searchers after the ultimate truth; but, while they—usually in reference to a concrete case—sought out the truth and applied what they had found, they combined with the freedom from constraint of speculation, the life-freshness of practice, and the power of assuring the operativeness of their abstract propositions.'"

slowness and practical urgency that mark the development of Roman law. In short, if the Roman law tells us to give to every man his due, it does not stop with this abstract ideal but it tells us in concrete detail what is a man's due. This the Greek moralist failed to do. That the Roman jurists did so, makes their contribution to the intellectual history of man comparable in worth with that made by the Greek scientists.[1]

For further study read:

Dunning, W. A., A History of Political Theories, 1902, chapter IV;

Maine, H. S., Ancient Law, 5th ed., 1873, chapters II–IV;

Gibbon, Decline and Fall of the Roman Empire, chapter XLIV;

Smith, M., Roman Law in the English Universities, Classical Weekly, 1916, *9*, 218–220.

For more extensive study read:

Bryce, J., Studies in History and Jurisprudence, 1901, 71–123, 556–606, 745–781;

Sohm, R. (transl. Ledlie), The Institutes of Roman Law, 1907, especially Part I;

Goudy, art. Roman Law, in Encycl. Brit., 11th ed.;

Muirhead, J., Historical Introduction to the Private Law of Rome, 2d ed. 1899;

Jhering, R., Geist des römischen Rechts, 1894–1907.

[1] Among famous Roman jurists were the following:—Cicero (*fl. c.* 60 B. C.) in the last days of the Republic. His writings were quite influential in the days of the Empire; Labeo (*fl. c.* 10 B. C.) under the emperor Augustus; Julianus (*fl. c.* 140 A. D.) under Hadrian and Antoninus Pius; Gaius (*fl. c.* 150 A. D.); Papinianus (*fl. c.* 200 A. D.) and Ulpianus (*fl. c.* 210 A. D.), his pupil; Paulus (*fl. c.* 210 A. D.); and Modestinus (*fl. c.* 250 A. D.).

CHAPTER XVIII

THE CHRISTIAN PHILOSOPHY

1. Introductory.—The extreme hypothesis that Christianity is the outcome merely of general Oriental and Hellenistic religious tendencies is rejected by the best scholarship; for according to this scholarship both a real personality and an original and deep personal religious experience underlie Christianity. Moreover, the original gospel of Jesus is remarkably free from Hellenistic philosophy, though it presupposes of course the contemporary religion of Judea and the holy writings of the Jewish Church. However, what is true of Christianity at its source is no longer true of Christianity, the universal religion, the religion of the Roman Empire of the fourth and later centuries; for Christianity had by that time become twofold in nature. On the one hand, still preserved in it was the deep loyalty to the historic Jesus and to His gospel; but on the other hand, so large an element of Oriental and Hellenistic religion and philosophy had entered it that Christianity had become, not only because of its membership but also because of its organization and theology, a Mediterranean religion. It had become the Holy Roman, or universal Church.

These facts indicate in historic Christianity two distinct tendencies because of which, no matter how completely united, the church persists in tending to break apart. The older tendency exhibited in a large part of the New Testament record teaches a law to govern men's lives and promises for obedience to this law a blessed immortality. The

second tendency, distinctly Hellenistic and Oriental and exhibited already in the Pauline and Johannine parts of the New Testament, teaches a way by which man's corrupt and fallen nature is to be saved from the flesh and is to be made again holy, spiritual and divine. The working out of this latter doctrine as the solution of a great philosophical problem gave rise to the Christian philosophy and the working out of this doctrine as a great religious principle gave rise to the religion of the universal church of the Mediterranean world.

The tendency to find in Christianity merely a law of life taught by the divine Master threatened at first to make the new religion only a Jewish sect and to restrain it from becoming a universal religion. In later days it threatened to interpret the nature of the Christ as merely that of a created divine agent by which the ultimate God revealed His will and truth to men. In its extreme form this tendency was against all other religious tendencies both within and without the Church and therefore was condemned as heresy and overcome.

The tendency to find in Christianity not only a law of life but chiefly a supernatural means by which man's fallen nature might be restored and made divine led some believers from the beginning to preach Christianity as a religion of *both* Jew and Gentile and to eliminate from it its associated Jewish characteristics. The first great leader in this broader enterprise was St. Paul, the Apostle to the Gentiles. He was well fitted for this noble mission. A Jew trained in the strictest school of the Jewish law he grew up in Tarsus, one of the thoroughly Hellenistic cities of Asia Minor and in an environment that had earlier absorbed the Stoic conception of the world and the Stoic doctrine of life. Christ thus came to appeal to St. Paul not only as the fulfiller of the Jewish law but as the one desired and expected of *all* nations. Therefore the mission

of Jesus seemed to him to be to all peoples, and he hoped to live himself to carry the divine message to the ends of the earth. He did help to carry it as far as Rome.

As the former tendency led the Church to conceive of Christ as the agent of God, as a created being between God and the world and identifiable with the *logos* of Greek philosophy; so the latter tendency led the Church to conceive the Master as the incarnate God, identified it is true with the *logos* but also with God, and to conceive of Him as the means by which man is to be united again with God and by which man's fallen nature is to be raised again to its original divine character. From the former point of view the believer found in Christ the Jewish Messiah and teacher sent from God; from the latter point of view the believer found in Him the redeemer and the mystical and sacramental instrument by which God's grace is given to man. This latter point of view finally became accepted in the fourth century as orthodox and apostolic after a bitter struggle with its rival. It is especially associated with the great church-father Athanasius. Its great rival was in those days named Arianism after another leader, Arius. These two tendencies in Christianity, the orthodox and the mystical, on the one hand, and the ethical and the non-mystical, on the other, gave rise also to two radically different views of religion and of the Church. The one emphasizes the sacraments as the means by which man is to be redeemed and regards the Church as a divine agent and instrument created by God and coming from heaven to bring God's grace to man. The other emphasizes the Christian morality and the establishment of God's kingdom on earth and regards the Church merely as the invisible company of all the faithful. Evidently modern Christianity and the Christian thought of to-day exhibit both these rival tendencies as still persisting and as still dividing Christians.

Two other characteristics of early Christianity must be emphasized. The first was its hostility to culture, learning and philosophy. The second was its intolerance of other religions. Christianity grew rapidly in the great centers of population especially among the slaves and the poor and only slowly made its way into the aristocratic, cultured and ruling classes. Of course it always had great minds among its leaders but these leaders themselves exhibited a hostility to "the wisdom of this world," to the "learning of this world which God had made foolishness," and they boasted of the wisdom hidden from the wise and prudent and revealed unto babes. Hence in time came the famous mottoes, *credo quia absurdum* and *credo ut intelligam*. However, the day dawned when, in spite of opposition, another spirit began to manifest itself. Christianity had to defend itself and make itself understood by the learned and the rulers and had to satisfy the intellects of its own thoughtful followers. This movement began with the so-called Apologists of the second century and in the third century in Alexandria developed into a distinctly philosophical school studying the pagan philosophers and basing Christian theology explicitly upon a Greek philosophical foundation. The result was that in a century the orthodox theology was as truly a Greco-Roman philosophy as was its great rival, Neoplatonism, and was deeply indebted to precisely the same philosophical sources as was the latter. This could not have been different, for the intellectual leaders had to use the philosophy of the age and there was but the one,—the Hellenistic.

The remaining characteristic to be emphasized is the Christian intolerance toward other religions. This intolerance the Christian shared with the Jew; but there remained a great difference between their standpoints. Judaism was a national religion and was treated by the Roman statesman with somewhat the same wise tolerance

with which he treated other national cults and religions; but Christianity was a new sect and its unwillingness to conform to the few simple requirements of the state religion could be interpreted only as the maddest obstinacy and as downright treason. A different hostility arose against Christianity on the part of the masses. It denied their gods and it denounced their circus; and they in turn classed it together with Epicureanism and Judaism as atheism. But the intolerance of the Christian is important to explain not only the persecutions in an age of great religious tolerance but also the very survival of Christianity. Like all men of these days the Christian believed in higher powers, or demons; but he identified the gods of the Gentiles with the evil demons with whom he could have no relations without peril to his salvation and with the very superhuman powers that had crucified his Lord and against whom he had to fight. Moreover, his intolerance inspired his remarkable missionary spirit which was almost invisibly carrying Christianity into all lands and even into Cæsar's household. In other words, had the early Christian compromised with the many religious movements and cults of his day, the tremendous forces that did indeed transform and obliterate many elements of the original faith and practice, would have made Christianity disappear altogether in the general religion of the Greco-Roman world, instead of keeping it in marked relief as a new power within the Mediterranean religion.

2. The development of Christian philosophy.[1]—We have seen that at first Christians felt no need for a specula-

[1] Among the prominent Christian philosophers, or fathers of the Church, the following have especially contributed to the development of the ancient Christian philosophy, or have through their writings especially influenced later Christian thought in the West: Justin Martyr (*fl. c.* 140); Irenæus (*fl. c.* 175); Tertullian (*fl. c.* 200); Clement of Alexandria (*fl. c.* 195); Origen (*fl. c.* 225); Cyprian (*fl. c.* 250); Eusebius (*fl. c.* 300); Athanasius (*fl. c.* 335); Basil (*fl. c.* 370);

tive, or reflective philosophical formulation of their religious principles. Rather they felt not only content with the popular philosophy which they possessed as children of their age but also distrustful of the culture of the learned classes. Further, we have seen that the need for philosophy arose only gradually and was first markedly present in the third century, and was due to the following circumstances:—First, Christianity had to be defended before the court of the ruling and cultured classes; second, the Apostolic tradition had to be defined and defended against novel or extraneous doctrines, called heresies; third, men trained in the philosophical schools were beginning to appear among the converts to Christianity and in becoming Christians these men continued the "way of life" of the philosopher; finally, the mere fact that the Christian Church included men of high intellectual endowment and that the great Christian centers of the Mediterranean world were highly enlightened and philosophically stimulating made it impossible to keep Christianity merely a religion and not also a theology.

In other words and expressed at greater length: the apostolic tradition had to be kept intact against the encroachment of the many foreign religious and philosophical influences which from the beginning threatened to overwhelm it; and yet no man could live in the Greco-Roman world and not be immersed in Hellenistic and Oriental thought and religion. Hence there were heresies both without and within the church which had to be combatted. Moreover, the church had to define and systematize her doctrines for the instruction of her own people especially along those lines where, because of the thought of the day, her children were most liable to be led astray. In particu-

Gregory of Nyssa (*fl. c.* 370); Gregory of Nazianzus (*fl. c.* 370); Ambrose (*fl. c.* 380); Jerome (*fl. c.* 380); Augustine (*fl. c.* 400); Gregory the Great (*fl. c.* 580).

lar, the church was compelled to define her peculiar doctrine of the nature of the redeemer, the incarnate God, and to identify Him with the ultimate God; for this was a doctrine that seemed to the Hellenistic philosopher an absurdity and to the Hellenistic mystic a religious backsliding. This doctrine was finally declared to be of the orthodox faith at the great council of Nicea in 325. In later councils the church defined also the twofold nature of Christ by declaring Him to be very God and very man, two complete natures in the one person. To complete her doctrine she had also to declare her own nature and mission in the world and to define the means of the soul's salvation. This she did by teaching man's complete fall from his original state and his present utter helplessness to save himself by his own efforts. His only method of salvation is through God's grace and the church's sacraments. The church is thus the divine agent God has sent into the world and the only means through which man can be saved. The church is the city of God that is above the earthly city, the ultimate vice-gerent of God in whose hands are the keys of hell and heaven.

The first movement within and without the Church against which the Christian thinker was forced to contend was the religion called Gnosticism. Gnosticism was an older religion than Christianity, of Persian origin with Hellenistic additions. It shared with the other religious movements of the periods the chief characteristics of Hellenistic religion and therefore shared these with Christianity also. There was the longing for redemption, the tendency toward asceticism, the belief in the fall of man, the undervaluing of science and the overvaluing of the super-rational, and finally the expressed need for revelation, sacraments, initiations, magic and allegory. As distinct from Christianity Gnosticism tended, as a Persian religion, to be strongly dualistic, that is, to believe that two

principles, the good and the evil, are at work in the world; and as distinct from Christianity it tended to dissociate its scheme of redemption from the historic Christ and to associate the God of the Old Testament with the evil god rather than with the good god. That is to say, it undervalued the historic teaching of Jesus and valued highly that of St. Paul and it undervalued the Jewish scriptures and religion. It differed from Christianity also, we should add, by tending to remain many dissociated free sects rather than to become an organized church. Gnosticism reached its greatest strength in the first and second centuries and therefore it was at that time that the Christian church was most imperilled by the Gnostic influence. Fortunately, however, its influence was in part negative causing a movement among the orthodox Christians in the opposite direction from that in which it tended. That is, the Jewish scriptures were valued all the higher, the life and teaching of the historic Jesus were emphasized all the more, the Apostolic writings were segregated and became canonical and the Apostolic tradition was kept authoritative. Finally, the Church became more centrally and thoroughly organized and its teaching became controlled by authority. But the influence of Gnosticism on Christianity was also positive and direct.[1] That is, it influenced Christianity positively by emphasizing the sacramental, the fall, the use of allegorical interpretation, the ascetic life and other beliefs and customs prominent in later Christianity.[2]

[1] This positive influence accounts in part for the marked difference to this day between eastern and western Christianity.

[2] In the struggle to become the universal, or Roman religion, Christianity had later two other powerful and most important rivals in the two Iranian religions, Mithraism and Manichæism. These two religions also are quite characteristic of the religious tendencies of the age. For a brief account of them read the articles Mithras and Manichæism in the Encyclop. Brit., 11th ed.

The foregoing paragraphs will help us to understand also the relation of the Christian thinkers to Neoplatonism. This relation is most clearly expressed by saying that the two rival philosophies were sisters, the offspring of the same parents, the Pythagorean, Platonic and Hellenistic philosophies, and that they were both the result of the same general intellectual environment. To the Neoplatonist the Christian thinker was a man who had spoiled Greek philosophy by adding absurdities to it. In the words of Porphyry quoted by Harnack, the life of Origen, the great Alexandrian Christian thinker of the third century, was outwardly "that of a Christian and contrary to law; but, as far as his views of things and of God are concerned he thought like the Greeks, whose conceptions he overlaid with foreign myths." In return, the Christian thinkers accused the pagan philosophers of having borrowed their most important doctrines and notions from the sacred writers of the Church. And the important point for us to notice is their mutual recognition of near relationship.

Let us consider the common doctrines that make both philosophies typical of their age. In the words of Harnack, they both set out from the felt need of redemption, they both sought to deliver the soul from sensuality and they both recognized man's inability without divine aid—without a revelation—to attain salvation and a sure knowledge of the truth. From the fourth century the many common elements of the two philosophies played a marked rôle in Christian thinking and really made the two philosophies one except on the doctrines of the incarnation, the resurrection of the flesh and the creation of the world in time. "If a book does not happen to touch on any of the abovementioned doctrines, it may often be doubtful whether the writer is a Christian or a Neoplatonist. In ethical precepts, in directions for right living (that is, asceticism),

the two systems approximate more and more closely. But it was here that Neoplatonism finally celebrated its greatest triumph. It indoctrinated the church with all its mysticism, its mystic exercises and even its magical cultus as taught by Iamblichus. The works of the pseudo-Dionysius contain a gnosis in which, by means of the teaching of Iamblichus and Proclus, the church's theology is turned into a scholastic mysticism with directions on matters of practice and ritual. And as these writings were attributed to Dionysius, the disciple of the apostles, the scholastic mysticism which they unfold was regarded as an apostolic, not to say a divine, science. The influence exercised by these writings, first on the East, and then—after the 9th (or 12th) century—on the West, cannot be overestimated."

For further study read:

Encycl. Brit., 11th ed., arts. Christianity, Church History, and Gnosticism;

Glover, T. R., Conflict of Religions in the Early Roman Empire, 3d ed., 1909;

Paulsen, F. (Thilly transl.), System of Ethics, 1899, 65–115.

For more extensive study read:

Wernle, P., The Beginnings of Christianity, 1903;

McGiffert, A. C., The Apostolic Age, 1900;

Harnack, A., The Expansion of Christianity in the First Three Centuries, 1904;

Ramsay, W. M., The Church in the Roman Empire, 1893;

Dill, S., Roman Society in the Last Century of the Western Empire;

Hatch, E., The Influence of Greek Ideas and Usages upon the Christian Church, 1890 (Hibbert Lectures);

Pliny the Younger (Firth transl.), Letters (Camelot Series);

Gwatkin, H. M., Selections from Early Writers Illustrative of Church History;

Glover, T. R., Life and Letters in the Fourth Century, 1902;

Harnack, A., History of Dogma, 1899;

Dunning, History of Political Theories, 152–160;
Cambridge Medieval History, Vol. I, chapters IV, V, VI and XVIII.

3. Augustine.—Ancient Christian philosophy reached its final stage in the West in the writings of the great thinker St. Augustine,[1] bishop of Hippo in Africa. The transcendent God of Neoplatonism is the accepted belief of this theologian. "God is an eternal, transcendent being, all-powerful, all-good, all-wise; absolute unity, absolute intelligence, and absolute will; that is, absolute spirit. He is absolutely free, but His decisions are as unchangeable as His nature; He is absolutely holy and cannot will evil. In Him willing and doing are one; what He wills is done without the help of any intermediate being or *logos*. In Him are all ideas or forms of things; which means that He proceeded rationally in creating the world and that everything owes its form to Him." [2] But the world is not a mere evolution from God as the Neoplatonist teaches. God created the world out of nothing. That is, God is not only super-rational he is also supernatural. Though the world depends upon him for its

[1] *Fl. c.* 400. He was at one time a Manichæan from whose dualism he was converted to Neoplatonism. Finally, he was converted to Christianity through the preaching of Ambrose, bishop of Milan. The influence of the earlier philosophical beliefs of Augustine remain evident in his thought throughout his later writings. Augustine was both a general philosopher and a Christian philosopher; and the two philosophies are far from being in harmony. In this section we are studying him solely as the latter, that is, as the thinker who gave the medieval western church her greatest treatises on dogma and who has been to this day the most influential theologian in the West. As a general philosopher Augustine was virtually without influence until modern days when what Windelband happily calls his metaphysics of inner experience, plays an important part in the struggle against both Aristotelianism and Neoplatonism and leads on to a doctrine known in modern philosophy by the name, idealism.

[2] Thilly, History of Philosophy, p. 149.

existence and though its continued existence is a continuous creation, God and nature are absolutely distinct. Again the very process of creation itself is above both reason and nature. Creation is not an event in time or space but logically prior to both; for both time and space are themselves creatures of God. Here, however, orthodoxy compels Augustine to add, the world is not eternal but had a beginning as have all its particular objects.[1] Finally, God created not of necessity but out of love. Creation was an act of free will.

Against Manichæism, or the Persian belief in the two ultimate principles good and evil, spirit and matter, Augustine taught that God created matter. All is from God. But whence then came evil? If the world is entirely from God it must be perfect and good. The answer is characteristic of the late Greek philosophy. Evil is necessary to the perfection of the world, as the shadows are necessary to the beauty of the painting, statue or landscape. Moreover, evil is not a distinct stuff over and above the good, for evil is a mere absence of the good as the shadow is the mere absence of light. It is an absence of being, or form in that which might have had being. Even so, is not God the source of this shortcoming? Augustine replies: No. The source is the free will of God's creatures. He gave them free wills and in so doing made them of a higher nature than they would have been as mere passive agents of His will. With their free wills they could either turn toward God or turn from Him. Evil has come from the fact that they have chosen to turn away from Him and from the fact that in so doing they lost Him and therefore have lost the good. In short, man's free will is the

[1] But as time is itself created, this beginning of the world must be a merely logical and not a temporal beginning. A temporal beginning of the world was and has remained an embarrassing dogma of the Church to the Christian philosophers.

source of man's imperfection, but man was capable of being perfect. Man, not God, is responsible; and he is so, even if God foresaw that free man would sin.

Man has fallen, and with man's fall evil has entered the world. Notice, *man* has fallen, not men.[1] In Adam all men sinned. In short, Adam's sin was not a mere event in the life of one man but was a cosmical revolution, a world rebelling against its creator. With the fall man was lost. Here another essential doctrine of Pauline Christianity is philosophically founded. Man is lost and through no power of man can man be saved. Left to himself man can but sin, for his true freedom has gone. God alone can save man by His grace. Man must be redeemed and God alone can redeem him. As we have seen, this was an age that had lost confidence in what man's efforts can do. His case is hopeless unless help come to him from beyond the world. But how is this help to come? Are all men to be saved and is the world to be restored to its original perfection? Evidently, the hard facts of life prove that this is not so. The world is evil and is lost; men are evil still hundreds of years after the Christ has come. Such is not God's salvation. Rather God saves not man but men. He chooses whom he shall save and whom He shall leave to their sin. But is not salvation free to all to choose or not to choose? No; man cannot even choose to be saved, for man is hopelessly corrupt. If he is saved, God does all. The agent by which this salvation is consummated is the grace of God working through the Church and her sacraments. Without the church there is no

[1] That the fall is the fall of each man was the doctrine of the Pelagian heresy against which Augustine fought for years. Indeed it was essential to the Church's doctrine of redemption that mankind as a whole should be fallen and that, for example, the future man should be saved through Christ's sacrifice as well as the sinful men of the past.

means of salvation. Thus the church is conceived not as a society within the world but as a wonderful cosmical entity coming from God and supreme over the destiny of man. It is thus superior to the state and to all other human institutions and enterprises. It is the City of God descended from heaven. The church and the angels constitute the great intermediary between the ultimate God and the cosmos; and they thus correspond to the intermediary powers and stages believed in by the whole intellectual world of the Greco-Roman period.

For further study read:

McCabe, J., Saint Augustine and His Age, 1903;
Augustine, The City of God [especially Books I, VII, X, (IX in the Temple Classics edition) XII (XI), XVIII (XIV), XXI–XXII (XVII–XVIII)];
Augustine, Confessions;
Cambridge Medieval History, Vol. I, chapter XX.

4. Gregory the Great.—We may pass at once from Augustine to the great pope Gregory. The further decadence is marked. "Gregory's mind was less antique, and more barbarous and medieval than Augustine's, whose doctrine he reproduced with garbling changes of tone and emphasis. In the century and a half between the two the Roman institutions had broken down, decadence had advanced, and the patristic mind had passed from indifference to the laws of physical phenomena to something like sheer barbaric ignorance of the same. Whatever in Ambrose, Jerome, or Augustine represented conviction or opinion, has in Gregory become mental habit, spontaneity of acceptance, matter of course. The miraculous is with him a frame of mind; and the allegorical method of understanding Scripture is no longer intended, not to say wilful, as with Augustine, but has become persistent unconscious habit. Augustine desired to know God and the Soul, and

the true Christian doctrine with whatever made for its substantiation. He is conscious of closing his mind to everything irrelevant to this. Gregory's nature has settled itself within this scheme of Christian knowledge which Augustine framed. He has no intellectual inclinations reaching out beyond. He is not conscious of closing his mind to extraneous knowledge. His mental habits and temperament are so perfectly adjusted to the confines of this circle, that all beyond has ceased to exist for him.

"So with Gregory the patristic limitation of intellectual interest, indifference to physical phenomena, and acceptance of the miraculous are no longer merely thoughts and opinions consciously entertained; they make part of his nature. . . . Gregory represents the patristic mind passing into a mere barbarous stage. He delighted in miracles, and wrote his famous *Dialogues on the Lives and Miracles of the Italian Saints* to solace the cares of his pontificate. The work exhibits a naïve acceptance of every kind of miracle, and presents the supple medieval devil in all his deceitful metamorphoses." [1] Another feature of the complete decadence exhibited in Gregory is his doctrine of penitence and penance. "Our whole life should be one long penitence and penance, and baptism of tears; for our first baptism cannot wash out later sins, and cannot be repeated."

5. Conclusion.—Here we have come to the end of ancient thought. In Gregory the theologian and in the late Neoplatonists the ancient Mediterranean philosophy has reached its last stage. An older civilization is dying, and her philosophy is the philosophy of despair and of fatigue, the philosophy of old age and of death. The pride and effort of man and of his intellect have ended in defeat. Man can do nothing. His institutions and his

[1] Taylor, Medieval Mind, pp. 98 ff.

science, all of his volitional life in history and all of his struggle to conquer the world by his skill and to make it the ideal earthly city have been vain. Only in another, a higher world can man's hopes be realized. This lower world is not the stage in which man works out his true destiny but is rather the tomb from which man is to be rescued. The ideal earthly life of man is to labor to escape from the lower world and from the flesh, and to deliver his soul by penitence, fasting and prayer and by God's grace from its earthly dwelling, the body with its lusts. Nothing on earth is fundamentally important except this escape. Man's true interests are elsewhere; and the highest life he can lead is one devoted to contemplating the world beyond this world. The good is not as the old Greeks thought wisdom and beauty, but the super-rational vision of heaven, the ecstasy of divine intoxication, the mystical union with God.

What a contrast if we compare this age with that of Athens in the days of Pericles! What a contrast indeed if we compare the philosophy of this age with the thought of men, with the energy of men, with the hope of men and with the religion of men during the past four centuries in our modern world! For again we shall see the philosophy of youth and young manhood. Again we shall see man struggling from primitive thought to science. Again we shall see the philosophy of the rational life, of enlightenment, assert itself against the philosophy of mysticism and hypnosis. But in saying this let us beware of youth's error, for life contains both youth and old age and old age has its vision as truly as has youth. As a youth man must struggle to know the world and to master the world and to make the world the ideal home for his highest life; but in old age the world conquers man and man faces the defeats and failures of his life and the vast realm of the unknown which his science has not yet been able to reveal

to him. Thus there are two sides to life. There is the struggle to conquer and to know; hence, intellectualism and the philosophy of the enlightenment: and there is the sense of failure and the presence of the unknown; hence mysticism and the philosophy of the super-rational.

PART III

MODERN PHILOSOPHY

CHAPTER XIX

THE ATLANTIC PERIOD

1. Introductory.—There have been, as explained in an earlier chapter, three major epochs in the history of western civilization, the River Period, the Mediterranean Period and the Present, or Atlantic Period. The River civilization expanded into the Mediterranean civilization and continued as a part of the wider culture; and in turn the Mediterranean civilization expanded into the Atlantic civilization and became a part of this still more extensive culture. The age of transition, from the Mediterranean period to the Atlantic, lasting from five to ten centuries, is usually called the Middle Ages and in contrast to these centuries the last five or six centuries are called the Modern Age. However, the student of history does well not to make many subdivisions and not to make sharp the boundaries between periods. History has too much continuity to be divided thus into discrete parts. Indeed, it is proper to begin a history of the middle ages back in the fourth century in the time of Constantine and in contrast it is proper to say that ancient or Mediterranean history continued to modern times in parts of the Mediterranean basin and the near Orient. Thus the term, the middle ages, is decidedly ambiguous and misleading unless the student is warned to use it cautiously. It denotes the childhood of the Atlantic period, the time during which the northern peoples of Europe were invading and settling in the western half of the Roman Empire and were breaking down in part the older culture and institutions of the

empire and the time during which the modern nations of northern, western and southwestern Europe were arising out of the political and social confusion resulting from the breakdown of the older order.

The extent of this breakdown was unequal in different parts of the western empire, depending upon the degree to which these parts had been originally romanized and upon the extent to which the invaders destroyed the older culture and superseded it with their own customs. The most evident instance of this difference in breakdown of the old and introduction of the new cultural factors is to be seen in the languages of modern Europe. In Italy, Spain and France the Latin language was able to triumph over the tongues of the invaders and to give these nations Romance languages; whereas in Great Britian and Central Europe the Germanic languages dominated. However, more important than the extent to which language survived, was the extent to which the older culture survived in the different lands. In Italy the survival was greatest; for Italy, in spite of invasion and political upheaval and confusion, remained essentially Italian in culture. Italy had, it is true, a dark period, a period when the light of art, literature and intellectual life was dim; but this period was relatively short. Next to Italy in these respects comes southern France. Southern France had been thoroughly romanized and remained throughout the middle ages in close relation to Italy and to Italian culture. Spain and northern France come next in this order, and finally Great Britain and Central Europe come last. Indeed, what Great Britain and Central Europe formerly had of Mediterranean culture was lost and what they afterward acquired was brought to them through Italy and France.

2. The development of medieval and modern culture. —The darkest days intellectually were the five centuries from 500 to 1000. In the eleventh century learning again

began to advance; and during the two centuries from 1000 to 1200 western Europe was eagerly studying and mastering what remained accessible of the older Mediterranean culture. These seven centuries, especially the four centuries from the reign of Charles the Great, are appropriately called the elementary school days of modern Europe; for in these days the thinkers of the new age studied the culture of the old age with the faith, the submission and the docility of childhood. That is to say, a barbarous Europe had first to master the higher culture of the Mediterranean world before it could even criticise that culture, before it could begin to think and to explore by itself, and before its own genius could rebel against the schoolmaster and his essentially foreign doctrines. The wonderful thirteenth century marks a transition in this development. The self-confidence and the self-assertion of youth appear and, excepting interruptions due to war and tumult, continue to increase until modern Europe reaches full manhood in the sixteenth and seventeenth centuries. That is, the centuries from 1200 to 1600 may be appropriately called the youth and adolescence of the Atlantic period. In these four centuries Europe masters the lessons of her ancient instructors, begins to think for herself and to criticise what she has learned, and enters upon the most remarkable period of independent discovery that man has ever known. The fifteenth, sixteenth and seventeenth centuries may be properly called the Age of Discovery, not because discovery or even revolutionary discovery ceased after 1700 but because these three centuries witnessed those discoveries which emancipated the modern mind from Mediterranean culture and started the most wonderful scientific epoch in the history of man. From 1500 to our own time and on into the future, how far no one can tell, comes the manhood of the Atlantic period, the Present Age. There are signs of its shortly (as history

counts time) merging into a World Age in which the Oriental peoples will play as important a part as the Occidental, with what results to the intellectual and philosophical development of man, no one can foretell.

3. The culture of the Atlantic period contrasted with that of the Mediterranean period.—Let us at once contrast the culture of modern Europe with that of the Greco-Roman world. Genetically the culture of our modern world has two parents, the Mediterranean culture and the native northern temperament and customs which, let us not forget, are as old in their origin as is the culture of the South. Our indebtedness to the Mediterranean culture, institutions and religion is enormous; but as no one can tell what our civilization would have been without the schooling of Greece and Rome, no one can calculate precisely the magnitude of this indebtedness, for we should include in the sum not only what we have borrowed directly from the old world but what we owe to the stimulus given to the northern peoples by the higher culture, what we owe thus indirectly. From Rome the medieval world learned the ideal of a universal society of men as against the narrow, provincial or tribal ideal of the barbarian. This lesson was taught in three greatest of traditions, the Roman Empire, the Roman Church and the Roman Law. From Greece, partly through Rome and her church, and in part directly, the medieval world learned her first and elementary lessons in art, in science and in philosophical reflection. And from Rome she received her elementary lessons in jurisprudence. More in detail, modern astronomy, mathematics, physics, biology, medicine, history and legal science, modern art, architecture, literature and religion genuinely continue the culture of the ancient world, even though the changes here and there have been vast and radical, and even though the temperament and

the philosophy behind the development have been fundamentally different.

But what do we moderns owe to our other parent, our northern ancestor? Surely something, if for no other reason, because the Mediterranean never ceased to be a foreign culture and therefore never could become completely dominant. Perhaps we may see the debt clearest in its medieval phenomena, in feudalism and chivalry, in the minnesinger, in the saga and in the romantic devotion and love of the saint, in the Gothic cathedral, in a certain romantic lawlessness and intolerance manifested toward restraint, order and system, and in love of wandering, adventure and daring. The northerner is not hard-headed, is not fundamentally intellectual, is not a lover of order and form, is not "classic." Rather he is sentimental, romantic, venturesome, restless, undisciplined and disorderly. He loves nature and nature folk on sea and land. He loves mystery and the *boundless* world. A crusader or a knight of the Holy Grail, a Norse pirate, a priest devoting his life to the care of the lepers on a lonely island, a St. Elizabeth distributing bread to the poor, and a Rousseau seem closer and more of kin to him than do Pericles and Socrates, Sophocles and Plutarch, or any other great Greek or Roman.

Of course, this is in part and of necessity an exaggeration. On the one hand, the Greeks also had their love of mystery and adventure, they too could be sentimental and they too loved nature. On the other hand, northerners have their astronomers and pure mathematicians, their periods of classic art and literature and they have hard-headed naturalistic philosophers. Great civilizations are infinitely complex; and it is probably impossible to point out an element, or feature in one that cannot be paralleled by a like element, or feature in the others. Still, though the differences may be reducible to averages and

to proportions, the differences are none the less marked. Compare the Parthenon with a Gothic cathedral, compare a drama of Sophocles with a drama of Shakespeare, compare a Greek lyric with a modern, compare a Stoic with an intellectual modern Christian, compare the Apology, Phædo and Symposium with à Kempis' Imitation of Christ, Bunyan's Pilgrim's Progress, Newman's Apologia or Rousseau's Confessions, or compare Pericles' funeral oration with what we should expect to hear said on a similar occasion. To do so is certainly to apprehend a marked difference.

4. Ancient philosophy contrasted with modern philosophy.—In particular we must compare ancient philosophy with modern. The basic differences are two. First, the ancient lived in a closed, finite universe with the earth at the center surrounded by the heavenly world of the stars and of God. The modern lives in an infinite, or boundless universe with its countless starry worlds of which the solar system is but one and that astronomically insignificant. The ancient lived in a world whose form and order seemed constant, eternal and divine. The modern lives in a world whose forms and orders seem fleeting, accidental and but mere samples of the infinite possibilities of which nature is capable. The ancient's world was relatively simple, the modern's world is infinitely complex. Second, the ancient philosopher, at least when he was not a skeptic, had full confidence in pure thought; and therefore the fulfillment of the work of science seemed to him not distant. The modern philosopher *that is genuinely modern*, is an experimentalist and has little confidence or interest in pure thought. He feels his way and does not expect to reach any permanent goal. He values facts and distrusts theories, for he outgrows theories almost as quickly as a youngster outgrows his clothes. He is not a skeptic, far from that, for his triumphs have been too

numerous. Rather his confidence in research is complete. But thinking divorced from experimental verification seems either untrustworthy or unprofitable. System and generalization he has to have or his facts would overwhelm him by their very number and confuse him by their variety; but system and generalization are ever changing and growing and this he both expects and welcomes. In the words of Professor Dewey, the modern thinker lives "in a universe with the lid off." In such a universe the intellectual Greek would have felt confused and troubled, but the modern thinker feels not only comfortable but enthusiastic. It is all a grand adventure into the realms of mystery. The modern thinker is confident that he is making excellent progress but he does not know and often does not much care, whither. Greek philosophy offered man a conception of the world and a view of life. Modern philosophy offers neither, but in their place presents us with the experimental method and the facts of evolution.

This again is of course an exaggeration. On the one hand, philosophies of the world and of life are numerous in modern days and many thoughtful men accept them with confidence. Many thinkers too have written "final books" and have offered the "last word;" and pure thinkers in logic, mathematics and mathematical physics have given us immortal treatises. On the other hand, experimental science existed among the Greeks, as we have seen, and many Greeks were mystics. Still, the foregoing contrast is justified. The Greeks were logicians, intellectualists and rationalistic philosophers; the moderns are experimentalists, pragmatists, sentimentalists and romanticists.

CHAPTER XX

MEDIEVAL THOUGHT

1. The medieval mind.—In this chapter we are to study the chief features of European thought from the fifth century to the fifteenth, that is, during the period called the middle ages. The preceding chapter has pointed out that during this time modern Europe is at elementary school and is therefore learning uncritically rather than investigating experimentally and thinking independently. In the earlier part of the period the pupil is utterly docile and humbly and obediently studies the fragmentary and decadent wisdom transmitted to him from the older culture by compilers of text-books.[1] The pupil's own writings are correspondingly childlike. These writings are at the best mere compilations in which he selects or interprets what his ignorant mind can discover in writings he does not truly appreciate and understand. They exhibit an

[1] Prominent among these text-books and other writings were Boethius' translation of Porphyry's Introduction to Aristotle's Categories, and of parts of the Aristotelian Organon; also Boethius' commentaries; Marcianus Capella's encyclopedia of the sciences; Cassiodorus' *De artibus ac disciplinis liberalium litterarum;* Isidore of Seville's Etymologies. Later Erigena's translation of Dionysius the Areopagite (the pseudo-Dionysius), a late Christian Neoplatonist. Besides these later writings there were especially available Plato's Timæus, parts of Cicero's writings, parts of those of Augustine and other western Church fathers, especially Ambrose, Jerome and Hilary. In general it is to be said that it is easy to exaggerate the lack in the middle ages of ancient Roman writings and those of the great western fathers. The knowledge of the Greek authors, however, was extremely meagre.

immense amount of merely verbal association and dispute with little sense of what is truly important and with little disposition to appeal to facts and reality for verification. Indeed, almost everything belonging to the intellectual world is settled and so suggests that it be learned and not investigated.

The two causes of this extreme docility are evident. In the first place, the communities where the older culture persisted were decadent and therefore conservative, looking back to the greater glory and wisdom of the past as supremely precious and excellent. In the second place, the new peoples were barbarians coming in contact with a culture that though decadent still transcended their culture and filled them with the same wonder and feeling of hopeless inferiority exhibited to-day by ignorant barbaric peoples in the presence of Europeans.

If we turn our attention from the mere ignorance and docility of Europe in these centuries to the more positive traits, two characteristics stand in relief. If the Mediterranean world back even in the fourth century was becoming barbaric again, western and northern Europe was decidedly barbaric in the succeeding centuries of political and social confusion. In short, Europe became again pre-scientific in its thought and in many of its customs. Men believed in magic and in frequently occurring miracles and did so as a matter of course. Men were animists and believed in a world about them populated with spirits and demons, a world in which Satan appearing in many shapes could work his mischief among men. It was an age in which political, social and religious institutions were not sharply distinguished in men's thoughts and customs, in which law and religious custom were largely interfused, in which men's religious beliefs and traditions contained interwoven in them what little scientific knowl-

edge they possessed. In short, politics, science and theology formed one body of knowledge.

A second positive characteristic stands in relief and is historically most important because it exhibits the new element that the northern peoples were adding to European thought while they were acquiring the southern culture. That is to say, the new France, England and Germany did not become Mediterranean in culture but developed a distinctly new culture to which indeed the old culture of Greece and Rome contributed but to which the northern peoples themselves genuinely contributed. This new characteristic was emotional. It is to be seen in the energy, the eagerness and the intense enthusiasm of the northerners. It is to be seen in their fear and terror and in their love and gentleness along with their anger, violence and cruelty. As a folk they were passionate and sentimental rather than intellectual and self-restrained. They could easily be taught to feel with intensity the guilt of sin. They could easily learn to fear hell and its terrors. They could easily be taught to love Jesus with utmost devotion. Romantic love and chivalry were virtually native to them, so spontaneously did these traits appear. The passionate devotion and religion of the monk and the sentimental idealism of the crusader and the personal loyalty of the serf or soldier to his lord or leader, and, we should add, the cruelty, the violence and the lawlessness of feudal society each and all manifested in typical ways these underlying northern traits. Such traits had to result in time in habits that made the later medieval religion, social and political institutions, art and literature radically unlike the ancient culture which formed their stimulus and pattern.

2. The three factors at work in medieval thought.—From the foregoing statements it follows that there were three distinct factors at work in the intellectual life of

Europe during the middle ages; first, fragments of the ancient culture of Greece transmitted to the West through Latin writers and the Roman political and legal tradition transmitted for the greater part directly; second, the catholic church with her institutions, ritual and doctrine; and third, the energy, the emotions and the customs of the Germanic peoples. The first factor should remind us that Greece did not directly influence medieval Europe, but that what the new peoples received was the culture of Italy, Spain and Gaul. This culture had absorbed Greek culture but in absorbing it had transformed it into a Latin culture. Moreover, this Latin culture was extremely decadent. It consisted of Neoplatonic metaphysics, logic, and ethics, of decadent compilations of ancient astronomy, geography, physical science and mathematics, of some knowledge of history but an uncritical knowledge and in addition of the art of chronology. Again it consisted of inferior codes of the Roman law, but later through southern Italy of the Justinian code; and of course it consisted of the actual political and legal customs and institutions surviving in Italy, Spain and Gaul from earlier times. The second factor included in addition to the church as a living institution with her clergy, her monks, her worship and her traditions a goodly quantity of her scriptural and patristic literature. Besides the Bible, this consisted of writings interpreting scripture for the most part allegorically, and the dogmatic and philosophical writings of the great Latin fathers. Here again the greater part of the thought was originally Greek, but Greek thought only as it had been assimilated and added to by the western thinkers.

Putting the beginning of genuinely medieval thought as late as the seventh century or even the Carolingian era we may speak of an era of transmission, the immediately preceding centuries, when the Roman peoples were still

endeavoring to romanize the barbarian invaders. On the one hand, were the compilers[1] of ancient wisdom who wrote books sufficiently elementary for their decadent days and the barbarous times following. On the other hand, were the great missionaries[2] to the Teutonic peoples in Gaul, England and Rhenish Germany, "who labored to introduce Christianity, with antique thought incorporated in it, and the squalid survival of antique education sheltered in its train." In addition there were the monasteries and their schools, and the court and cathedral schools.[3]

Here we should recall the great differences in the culture with which the invaders were surrounded in the different lands. In Italy the invaders never truly outnumbered the Italians and were themselves soon made Italians. Thus Italy, where the Roman culture was thoroughly at home, never ceased to be Roman in spite of the invaders, the pestilence and the confusion during the dark centuries from the fifth to the eleventh and in spite of the extreme decadence of the culture she retained. That is to say, the bond with the ancient world was never broken in her customs and thought; and when better days came a reviving culture was but the return of that which seemed her own naturally. In southern France similar conditions obtained, but the ancient was not quite so deeply rooted and the barbarians were less easily absorbed. In Spain again the ancient held its own tenaciously though here conditions were still less favorable and the Latin culture

[1] Such men were Boethius (*fl. c.* 510), Cassiodorus (*fl. c.* 520), Isidore of Seville (*fl. c.* 600) and Gregory (*fl. c.* 580).

[2] Such men as St. Columbanus, St. Gall, St. Augustine of Canterbury, and St. Winifried-Boniface.

[3] The basis of medieval learning was formed by the famous *trivium* (grammar, logic and rhetoric) and *quadrivium* (music, arithmetic, geometry and astronomy). For the former they depended especially upon the translations of Boethius and for the latter upon the compendia of Marcianus Capella, Cassiodorus and Isidore.

was still less genuinely native. In northern France the influx of barbarian folk was greater than in southern France, and this part of ancient Gaul had never been so thoroughly romanized as had the South. Therefore the ancient survived to a less extent. "The antique was not to dominate the French genius; it was not to stem the growth of what was, so to speak, Gothic or northern or Teutonic. The glass-painting, the sculpture, the architecture of northern France were to become their own great French selves; and while the literature was to hold to forms derived from the antique and the Romanesque, the spirit and the contents did not come from Italy." In England and Germany the Latin culture came as a distinct foreign influence, "which was not to pertain to all men's daily living. It was matter for the educated, for the clergy. Its vehicle was a formal language, having no connection with the vernacular. . . . The Anglo-Saxons and the rest in England were to become Englishmen, the Germans were to remain Germans; nor was either race ever to become Latinized, however deeply the educated people of these countries might imbibe Latinity, and exercise their intellects upon all that was contained in the antique metaphysics and natural science, literature and law."

What is true of the ancient culture is true in turn of Christianity. To the south it was a religion at home; whereas to the Franks, the Anglo-Saxons and the peoples of the Rhine and to the eastward it came as a new and strange religion. "And the import of the fact that it was introduced to them as an authoritative religion brought from afar, did not lessen as Christianity became a formative element in their natures." In short, to the Italian the older culture and religion seemed merely "a greater ancestral self," whereas to the northern peoples they seemed the sum of all knowledge and the highest point of human greatness. "The formulated and ordered Latin

Christianity evoked even deeper homage. Well it might, since besides the resistless Gospel it held the intelligence and the organizing power of Rome. . . . And when this Christianity, so mighty in itself and august through the prestige of Rome, was presented as under authority, its new converts might well be struck with awe. It was such awe as this that acknowledged the claims of the Roman bishops, and made possible a Roman and Catholic Church —the most potent unifying influence of the middle ages."

Thus under the action of the Latin Christianity of the fathers and the ancient culture "the peoples of western Europe, from the eighth to the thirteenth century, passed through a homogeneous growth, and evolved a spirit different from that of any other period of history—a spirit which stood in awe before its monitors divine and human, and deemed that knowledge was to be drawn from the storehouse of the past; which seemed to rely on everything except its senses; which in the actual looked for the ideal, in the concrete saw the symbol, in the earthly Church beheld the heavenly, and in fleshly joys discerned the devil's lures; which lived in the unreconciled opposition between the lust and vain-glory of earth and the attainment of salvation; which felt life's terror and its pitifulness, and its eternal hope; around which waved concrete infinitudes, and over which flamed the terror of darkness and the Judgment Day." [1]

The ancient culture and the religion of the church were to be gradually assimilated and to be recast by the mediaeval peoples, and in addition to this were to be emotionally transformed and were to have new emotional elements introduced into them. The result was medieval art, architecture, literature and piety, different from anything history had ever witnessed before and dear ever since to the lover of romanticism.

[1] Quotations from Taylor, The Medieval Mind, chap. I.

For further study read:

Taylor, H. O., The Medieval Mind, 2d ed., 1914, chapters I–VI;
Harnack, A. (transl. Kellett and Marseille), Monasticism, 1910;
Monroe, P., Textbook in the History of Education, 221–350;
Poole, R. L., Illustrations of Medieval Thought;
Henderson, E. F., Select Documents of the Middle Ages, 1910;
Thatcher and McNeal, Source Book for Medieval History, 1905;
Robinson, J. H., Readings in European History, Vol. I;
Paulsen, System of Ethics, 116–125.

For more extensive study read:

Rashdall, H., Universities of Europe in the Middle Ages, 1895;
West, A. F., Alcuin and The Rise of Christian Schools, 1892;
Taylor, H. O., The Medieval Mind;
Adams, G. B., Civilization during the Middle Ages, 1899;
Maitland, S. R., The Dark Ages, 1890;
Montalembert, C. F., The Monks of the West, 1896;
Taylor, H. O., Classical Heritage of the Middle Ages, 1901;
Life of St. Columban, in Translations and Reprints (University of Pennsylvania), Vol. II, no. 7.

3. The course through which medieval thought developed.—We may properly divide the medieval period into two subordinate periods, the period to 1100 and the period following. During the centuries preceding the eleventh the medieval mind was acquiring the decadent culture transmitted to it and doing so in a manner that was thoroughly elementary. It studied the patristic theology; it studied the ancient logic and rhetoric, the ancient philosophy, mathematics, astronomy, and other natural sciences; it studied the Roman law; and it read some Roman literature. Within each of these fields of study the learner gradually widened the extent of his acquaintance

and the breadth and depth of his interest. What he learned, he "labored to restate or to expound." But at first, that is, before and during the Carolingian period, this restatement was little more than "a mere shuffling of the matter" studied. Indeed, "the typical works of the eighth and ninth centuries were commentaries upon Scripture, consisting of excerpts from the Fathers." The tenth century shows improvement at least to the extent that the restatement is becoming more systematic. With the eleventh century, however, a marked change has come, the elementary lessons are proving to have been mastered. This advance Taylor summarizes thus: "Through the tenth and eleventh centuries, one finds no great advance in the systematic restatement of Christian doctrine. Nevertheless, two hundred years of devotion have been put upon it; and statements of parts of it occur, showing that the eleventh century has made progress over the ninth in its thoughtful and vital appropriation of Latin Christianity. A man like German Othloh has thought for himself within its lines; Anselm of Canterbury has set forth pieces of it with a depth of reflection and intimacy of understanding which make his works creative; Peter Damiani through intensity of feeling has become the embodiment of Christian asceticism and the grace of Christian tears; and Hildebrand has established the medieval papal church. Of a truth, the medieval man was adjusting himself, and reaching his understanding of what the past had given him."

With the twelfth century a marked advance in all departments of thought and culture are evident. In this century are to be found men widely read in the classical Latin authors and genuinely appreciative of their literary art and excellence. For example, John of Salisbury (*fl. c.* 1150) seems to have read and appreciated Terence, Virgil and Ovid, Horace, Juvenal, Lucan, Persius

and Statius, Cicero, Seneca and Quintillian. In Italy the study of the Roman law has reached a stage when the digest is studied with genuine juristic insight, when students by the thousands flock to the law schools of Bologna and Padua. In metaphysics and theology the thinkers of this century are penetrating deeply into the logical foundations of the church's faith and are adopting a distinctly independent intellectual attitude toward the faith. This can be seen in the very form of their writings, the *commentary* is giving place to *the book of sentences* as in the next century this gives place to the *summa*. That is to say, the thinker was passing from a mere expounder of the text of ancient authors to a writer of treatises in which he has mastered his sources having genuinely rethought them for himself.

Of all the medieval centuries the thirteenth was the most philosophical and scientific. Indeed signs of the actual beginning of modern times appear in this century, a century to be numbered among the greatest in history. The twelfth century had seen an increase in the number of ancient writings restored to the students of Europe. Among these were especially important works of Aristotle. It took several decades to master these difficult books; but when, by the middle of the thirteenth century, they were mastered, the effect was remarkable. We may explain this effect in part thus. Up to these times the philosophical teachers of Europe were the late Roman eclectic and Neoplatonic writers and the decadent transmitters of an earlier culture; whereas in Aristotle the medieval student was brought back directly to the golden age of Greek thought. In other words, the twelfth and especially the thirteenth centuries were able to get beyond the many centuries of decadent Mediterranean philosophy and become better acquainted with a very different intellectual world and were able to acquire something of

the broader and more genuinely intellectual interests of Greece of the fourth century B. C. The Aristotelian philosophy and science take the place of the Neoplatonic and patristic as the higher authority. The faith of the church is restated and rethought as an Aristotelian philosophy; and Aristotle becomes and has remained ever since in the Roman Church the *praecursor Christi*. The religious and theological interest is broadening into the entire range of Greek science, and thinkers are beginning to talk of experimenting and of observing nature. Indeed, like children they are beginning to experiment and investigate, that is, their research is half magic; but let us not forget that the astrology and the alchemy of these days are the direct and immediate ancestors of modern astronomy, physics and chemistry.

The last stage of medieval philosophical thought also begins in the thirteenth century. It comes as the rival of Aristotelianism and prophesies the coming struggle between the Aristotelians and the founders of modern science. It reacts against the entire endeavor to philosophize Christianity, an endeavor that, as we have seen, began in the third century and reached its fulfillment in two distinct Christian philosophies:—first, the Neoplatonic Christian philosophy of Augustine and the Neoplatonic schoolmen before 1200; and second, the Aristotelian Christian philosophy of the thirteenth century, the philosophy of Thomas Aquinas. Against this entire endeavor to philosophize Christianity the new movement in medieval thought contends that religion and revelation on the one hand, and science on the other hand, are two radically distinct matters. It is impossible to prove the church's faith and it is impossible to search out and explain the great mysteries of creation, sin and redemption. In religion we must rest satisfied to believe without understanding. Moreover, it is impossible to deduce validly a world

hypothesis out of mere logical principles as philosophers from the time of Plato have endeavored to do. Thus the entire enterprise of speculative philosophy is in vain, it is a mere war of words, empty of any genuine information. The true business of science is to investigate nature, to learn regarding the things of the world that form men's environment. Science must rise from the dust, it is fatal for it to try to soar among the clouds. Thus let religion and science each go its way in peace, religion to stir men's hearts and to win their wills, science to investigate nature.[1]

The various schools and parties of medieval thought survived not only into the following centuries but to our own times; for to outgrow the philosophic thought of the middle ages has been a long struggle and this struggle is by no means ended. However, the beginning of this struggle marked the beginning of a new age, the age of discovery. What the intellectual world lacked in those days was not thought but information; for information, not argument could decide the issues that were arising, and information alone could enable the European thinker to escape from medieval thought. This information began to come markedly in the fifteenth century and has continued to come uninterruptedly ever since.

4. The content of medieval philosophic thought.—The chief lesson the church had to teach the medieval people was her faith and dogmatic theology. To understand this body of doctrine required first an elementary training in the ancient culture in the form in which that culture still survived in the late western Roman Empire. Moreover, the writings of the church fathers contained far more than the scriptural and primitive Christianity, for they

[1] The names to be associated with this movement as those of its great leaders in the thirteenth and fourteenth centuries, are Roger Bacon and Duns Scotus and his pupil William of Occam. They all come from England, a fact, as we shall see, of great importance.

were composed by men that had been trained in the entire wisdom of their time. In other words, the supreme subject of thought and study in the middle ages was the church and her doctrine; and only incidentally and accidentally were fragments of the ancient culture also included. Therefore we may at once make two general statements: first, that the content of philosophic thought in the middle ages was the church and her doctrine; and second, that as this content slowly expanded so that it included besides more and more of the ancient culture and more and more of the facts of the world forming man's immediate environment, medieval thought passed into modern thought. That is to say, though the interests of the medieval thinker were at first exclusively theological; gradually three other interests arose and became prominent in the twelfth and thirteenth centuries. These interests were: first, the ancient pagan literature of Rome in the days of the republic and the early empire; second, the Roman law in the Justinian codification; and, lastly, the mind of man and the world that forms the subject of study in natural science.

From these facts two further truths follow immediately regarding the content of medieval thought: first, the medieval thinker was concerned with a body of *settled* doctrine taught and promulgated with authority and backed by the overwhelming power of the church; second, the medieval thinker was narrowly limited in the amount of information he possessed and therefore in the subject-matter of his thought. That is, he was extremely ignorant compared with the scientists of ancient Athens and Alexandria and compared especially with the educated modern. However, neither fact should hide from us the further fact that he was a great thinker though an ignorant man, that he was often a man of gigantic inborn intellectual capacity, at first a victim of his environment but

in the end a conqueror of the old world and a pioneer of a new world.

(a) **Platonic and Aristotelian realism.**—The faith of the church was virtually settled by the beginning of the middle ages and therefore required of her medieval thinkers only interpretation and philosophical formulation and justification.[1] Even this task of transforming the faith into a theology had been begun long before under the influence of the same general philosophy exemplified also in Neoplatonism and had reached its highest formulation in the works of Augustine. Indeed, in the broadest sense of the word, Neoplatonism, the Christian philosophy was Neoplatonic; and it remained so until the thirteenth century when it became Aristotelian. In the meantime, however, the early medieval thinkers continued the work of philosophizing the Christian tradition, sometimes in

[1] "From century to century may be traced the process of restatement of patristic Christianity, with the antique material contained in it. The Christianity of the fifth century contained an amplitude of thought and learning. To the creative work of earlier and chiefly eastern men the Latin intellect finally incorporate in Ambrose, Jerome, and Augustine had added its further great accomplishment and ordering. The sum of dogma was well-nigh made up; the Trinity was established; Christian learning had reached a compass beyond which it was not to pass for the next thousand years; the doctrines as to the 'sacred mysteries,' as to the functions of the Church and its spiritual authority, existed in substance; the principles of symbolism and allegory had been set; the great mass of allegorical Scriptural interpretations had been devised; the spiritual relationship of man to God's ordainment, to wit, the part to be played by the human will in man's salvation or damnation, had been reasoned out; and man's need and love of God, his nothingness apart from the Source and King and End of Life, had been uttered in words which men still use. Evidently succeeding generations of less illumination could not add to this vast intellectual creation; much indeed had to be done before they could comprehend and make it theirs, so as to use it as an element of their own thinking, or possess it as an inspiration of passionate, imaginative reverie." (Taylor, Medieval Mind, chap. I.)

the line pursued by Augustine and sometimes in the line of Neoplatonism in the narrow sense.[1]

[1] The most prominent among medieval thinkers were the following: —Scotus Erigena, from Ireland (*fl. c.* 850). He was active at the court school of Paris. Translated the pseudo-Dionysius. Far transcended the students of his age in his knowledge of Neoplatonic writers and their doctrines. Was himself a pronounced Neoplatonist. Anselm of Canterbury (*fl. c.* 1075). His most celebrated writings are the *Cur Deus Homo?*, the *Monologium*, and the *Proslogium*. These writings are especially renowned for their proofs of the existence of God. Notice the gap of two hundred years between Erigena and Anselm, the next equally noted thinker. In the early controversy between the realists and the nominalists the famous representative of nominalism was Roscellin of Brittany (*fl. c.* 1090) and the most famous opponents of nominalism were besides Anselm, William of Champeaux (*fl. c.* 1110) and Bernard of Chartres (*fl. c.* 1125). The Platonism of these days was based upon Plato's Timæus which was interpreted in the light of Neoplatonism. Abelard, of Pallet in the county of Nantes (*fl. c.* 1120). Taught especially at the cathedral school of Paris and at the school of St. Geneviève. One of the greatest thinkers of the medieval period. Represents the dawn of revolt against the supreme intellectual authority of the church. In the forementioned controversy he took a middle ground between the extremists. His great opponent was Bernard of Clairvaux, the great orthodox mystic of the twelfth century (*fl. c.* 1130). Another contemporary mystic that should be mentioned is Hugo, a monk of St. Victor at Paris (*fl. c.* 1135). Besides the forementioned thinkers two others should be named because of their wider interests. Gerbert, afterward Pope Sylvester II (*fl. c.* 980), became interested, through Arabian scholars in Spain, in mathematics and physics. John of Salisbury (*fl. c.* 1150) was widely and deeply interested in the pagan classical writers of ancient Rome. The reception of Aristotle falls in the century 1150–1250. "It began with the more valuable parts of the Organon, hitherto unknown, and proceeded to the metaphysical, physical, and ethical books, always accompanied by the introduction of the Arabian explanatory writings." "The doctrine of the Dominicans, which has remained until the present time the official doctrine of the Roman Church, was created by Albert and Thomas." Albert the Great, a Swabian (*fl. c.* 1235), taught in Cologne and Paris. "His writings consist for the most part of paraphrases and commentaries upon Aristotle." Thomas Aquinas, born in lower Italy, (*fl. c.* 1265), taught at Naples, Cologne, Paris, Rome and Bologna. His

The central problem throughout both the Neoplatonic and the Aristotelian medieval theology was the issue between the realist and the nominalist. Certain philosophical principles were required to prove that God exists, that though three persons He is one God, that all men fell in Adam's sin and that all men can be saved through the merit of one divine man, that the Church is an entity come down from heaven, a reality over and above the men and women who are her members, that in the eucharist the bread and wine literally become the body and blood of Christ and yet remain visibly bread and wine, and finally, in addition to other doctrines, that the church's view of life is justified, a view of life that is distinctly other-worldly, a view of life in which this world is but the threshold of a better world, in which the chief business of life is the

most noted writings are the *Summa Theologiæ* and the *Summa contra Gentiles.* Thomas is the most famous of the Aristotelian Schoolmen. "The Augustine Platonic opposition against the suspected Aristotelianism of the Arabians had as its chief supporters: William of Auvergne (*fl. c.* 1240) and Henry of Ghent (*fl. c.* 1260). "The sharpest opposition to Thomism grew out of the Franciscan order." Two men are especially important: Roger Bacon and Duns Scotus, Roger Bacon (*fl. c.* 1250), born in England, educated in Oxford and Paris. Bacon is famous for his reaction against the whole scholastic philosophy and his adolescent enthusiasm for natural scientific research. Duns Scotus was perhaps the most important medieval thinker (*fl. c.* 1300). His home was either in Ireland or Northumberland. He attacked especially the work of Thomas. The greatest leader of the fourteenth century nominalists was William of Occam, born in England, trained under Duns Scotus (*fl. c.* 1330). "He unites in himself all the elements with the help of which the new science forced its way out of Scholasticism." Although a loyal Churchman he took an active part in his day in the struggle of the State against the Church. Among the Arabian philosophers of the middle ages the following are the most famous: Avicenna of Bokhara (*fl. c.* 1020); Averroës of Cordova (*fl. c.* 1145); and, among the Jewish philosophers, Moses Maimonides of Cordova (*fl. c.* 1175). (This note is based in part upon the list of medieval philosophers given by Windelband in his History of Philosophy.)

salvation of the soul and the worship and contemplation of the heavenly host, a view of life in which the origin, the nature and the entire significance of this world is to be found in a higher, or supernatural world. To repeat, certain philosophical principles were needed to prove these several doctrines; and Platonic realism furnished them admirably.

Strange to say, these principles in turn virtually reduce to one and that is the relative philosophical importance of the individual concrete object and the genus to which that object belongs. For example, when we classify the animals, the classes seem more important than the individual specimen in our museum; and when we subsume the lower classes under the higher, these higher classes seem more important than the lower. Moreover, we may be prone to regard these classes as realities, to think of them as existing before the actual origin of the individual animals we have classed under them, and finally even to think of these logical entities that we have made logically prior to the individual, as the cause that has brought the individual into existence. That is to say: first, the Platonist confused logical existence, with existence in the sense in which the King of England and the Atlantic Ocean are asserted to exist; second, he confused logical priority in classification with pre-existence, that is, he asserted that the form, Cat preceded the individual cats, or in general, that the order of creation has been from the logically higher to the logically lower; third, he confused the logical priority in classification with causal origin, that is, he asserted that the form, Cat originated the individual cats, or in general, that the logically higher world is the creative originator of the logically lower world; and fourth, he confused the logical system of classes in which the lower classes are subsumed under higher and higher classes and fewer and fewer classes, the logical hierarchy, with the

spheres of existence suggested by the geocentric astronomy of the Greeks, with the scale of existent entities from earth to the heaven and to God beyond. Thus the world seemed to him a step ladder with God at the top and the things of earth at the bottom and the angels and the church, the kingdom of divine grace, in between. Again, the higher had to exist to make the existence of the lower possible; and therefore the higher was a *necessary* existent, whereas relatively the lower was an *accidental* existent. Indeed the higher had *more reality* and the lower less. Thus it follows that God, the logically supreme being by definition, not only exists necessarily but is the most real and perfect being. It follows that you and I and all men could fall before ever we existed; and it follows that you and I and all men could be saved as a race before ever we drew breath. It follows that the accidental features of the bread and wine are subsidiary to its substance, and that this logically prior substance is independent of the accidents and can change though they do not. It follows that the church is a higher order of existent than all things earthly and than all the kingdoms of men, that it stands between earth and God, that there is no medium between the individual and God except the church, the sacraments and the spirits and angels, God's higher creatures, that the church is not man-made but has descended from heaven and has absolute authority over men and holds the keys of heaven and hell. Finally, it follows that the significance of all things earthly is to be found in terms of things above, that the world about us speaks in every part of the heavenly world which it dimly reflects, that the world is but an allegory telling the story of the divine and higher world, that all creation looks upward to God and that nothing can be explained except in terms of the heavenly system, and that of all orders of existence nature and man's earthly enterprise are least important and least interesting

and are either important or interesting at all only because of their relations to the heavenly or higher world.

However, a reaction was soon to come against all this ancient realism. We can suppress human instincts, but they will refuse to die and will surely rebel at first secretly but at last openly. Man is an individual and is by instinct more interested in this individual than in the whole hierarchy of the worlds. The concrete world about him interests him instinctively, and a world of abstractions which interferes with this interest is in time sure to be swept away. In the middle ages this rebellion appears in philosophic thought as nominalism, that is, as the doctrine that the individual concrete object alone is real and that the genus is a mere symbol or word. Nominalism was of course latent heresy, and as such it was suspected and discouraged by the church. Carried out fully in practice it meant what Europe has since seen, democracy, individualism, worldliness, intellectual freedom, industrialism and nationalism. Its spirit can be seen typically incarnate in the English people even in those far away days. Thus nominalism was the medieval philosophical reaction against Neoplatonism and Aristotelianism and was the precursor of the distant storm. It fought Platonic realism even in the church's own arena, endeavoring to show that doctrine to be a hidden heresy and non-Christian. It asserted that Christianity is not a philosophical science but a revelation, is not a matter of intellectual debate, but a faith that wins man's heart and will. To prove the existence of God is impossible. Platonism is but a disguised pantheism which makes the world, from God to the humblest creature, a logical necessity and therefore ignores the noblest and most characteristic fact of life and of sainthood, the will and its struggle to realize its ideals. Let the church take her true place in the world. Let her set aside her worldly ambitions and return to the "simplicity, purity

and holiness of the apostolic times." Finally, instead of the world being a logical step ladder, it may be but the succession of individual entities and events throughout eternity each causing its successor.

Evidently nominalism is but an earlier form of the widespread modern philosophy called positivism. That is, it limits man's intellect to the study of what he can observe, the world of concrete individual objects; and it warns him not to attempt to go farther into the world's secrets, not to attempt to fly with the wings of logic and words up into a medium that will not sustain him. It teaches him that science is of the dust and that the pseudoscience of the clouds is mere words, high-sounding words, none the less words utterly void of information.

A further part of this medieval controversy is the problem: Has the intellect or the will the primacy? Though this problem is an early form of the psychological problem of the relation of man's intellect to his instincts and of the place of knowledge in human life, it is also a strictly philosophical problem. As a philosophical question it asks: Is the world one that can be understood, is it, in other words, an object that science can explain and analyze logically; or does the world ultimately defy both logic and science? The Neoplatonist regarded the world as logical; but the nominalist tended to regard it as alogical, for the world is ultimately like our wills as popularly conceived. That is, human conduct defies prediction and explanation, for the will is free; so also is nature free as the world created by the free act of God's will. His will and His ways are past finding out. They are so, not because we are ignorant, but because they have no explanation, because they cannot be deduced as can the properties of a triangle, because His will is free and is prior to His intellect.[1] In short, a

[1] This doctrine again is an early stage of a nineteenth-century philosophy that is called romanticism. Romanticism teaches that

science of creation and of why the world is the sort of world it is, is quite impossible.

A final subsidiary part of the struggle between the realist and the nominalist was the conflict between their moral theories. A Platonic morality is essentially a philosophical, or intellectual way of life; and a Neoplatonic morality, taking one step further in the same direction, is the freeing of the soul from the contamination of the flesh by means of the spiritual, religious and contemplative life. That is to say, the realistic morality is the centering of life's enterprise upon the return of the soul to God, upon freedom from the lower world and upon the contemplation of the heavenly world. It is essentially an other-worldly philosophy of life and is admirably exemplified for us in monasticism and in general in mysticism. In contrast, the nominalistic morality is exemplified rather in the earliest Christian tradition, in the life of mutual love and service, in the life of good works and of good citizenship, in doing one's duty in the ordinary walks of daily life. It is essentially of this world and its good deeds spring from man's interests in this world. The kingdom of God that nominalism seeks to establish is not beyond the moon but upon earth.[1]

nature is universally spontaneous and therefore inexplicable generation. It is the onward drive of creative forces which we can observe and record but never understand. Indeed, it is absurd even to try to understand them, for their very nature is to generate spontaneously and not to derive logically that which they produce.

[1] Notice that this conflict between realist and nominalist is an early stage of the development which was to split western Christianity in twain three centuries later. The nominalists were essentially Protestants and individualists, whereas the realists were the defenders of the philosophy that is essential to the Catholic theology and that has therefore remained the official philosophy of the Roman church. Again notice that the nominalists were chiefly English Franciscans and that English philosophy has remained typically nominalistic from the thirteenth century to the present time.

(b) The problem of the seat of authority.—There were, we saw, two major aspects to medieval theological thought. The first we have considered, namely, the endeavor to philosophize Christianity and the breakdown of this endeavor in nominalism. Let us turn to the other aspect, the fact that the faith of the church was taught to the medieval peoples as resting upon the authority of the church and not upon the intellect of the individual believer. Before medieval times the early church fathers had looked with distrust upon Greek philosophy and upon the effort to justify the faith as a philosophy. Not because the gospel message had been proved to them, did they believe; rather they believed because this message was the word of the Lord which was to make the wisdom of this world foolishness. As the church grew in power and was forced by the very spirit of the age to concern herself regarding the orthodoxy of her children, she taught, not as one debating with his intellectual peers, but as one speaking with authority, as the infallible guardian of a revelation committed to her by God Himself to be carried to all peoples. When finally the church brought her message to the northern barbarians and they cowered before her superior culture and wisdom, neither in her nor in them was any tendency to regard that message as one that could be questioned by the individual or as a doctrine of whose truth his intellect was to be the ultimate judge. In short, the ultimate seat of authority was not the individual but the church.

When later the medieval intellect first commenced to study and to philosophize, the universal attitude of both church and thinker remained the same as at the beginning. If Christianity was to be understood it must first be believed. The motto remained, *credo ut intelligam*. However, this attitude could not last. As men became more and more masters of the traditional knowledge and of the

intellectual habits of the thinker; their philosophizing became a serious and self-confident undertaking. They began to use it to help themselves to believe. In other words, they were becoming skeptical, much as they consciously or unconsciously suppressed their skepticism. For example, Anselm, the great thinker of the eleventh century and pious archbishop of Canterbury, though he never avowed to himself consciously any doubt in the church's infallible authority, seems none the less to have been genuinely skeptical in temperament. He was the author of famous arguments for the existence of God, and he seems to have labored long to discover them and to have needed them for his own peace of mind.

In the next century, the suppressed reason asserts itself in the voice of one of the greatest of Europe's thinkers, Abelard, who teaches that man is not to be required to believe on the authority of the church, for man's reason has the right to be satisfied. Our motto should be not *credo ut intelligam* but *intelligo ut credam.* Evidently this was a dangerous doctrine and was felt to be such in the time of Abelard. It is inherently a declaration of independence, and as the centuries went by it became not the motto of one man but the spirit of the intellectual world. It foretold the revolt of the modern man from the authority of his mother, the church; and it showed that her children were already reaching adolescence.

(c) **Medieval mysticism.**—But the thinkers of medieval Europe were not all intellectualists, for among them were many whose very philosophy was the vanity of all philosophy and science. There was the old controversy between the heart and the head. To the mystic, as ever, religion was a matter of personal experience, of direct insight and revelation. And the medieval church had her mystics to fear fully as much as her intellectualists; for a doctrine that made the individual religious

experience authoritative lessened and even undermined, no matter how unintentionally, the supremacy of church authority. Moreover, the mystics were close to the genuine medieval spirit and sentiment. In them the true medieval emotion could express itself; and it is the fact that the religious consciousness of medieval Europe did so express itself that has made the devotional literature of medieval mysticism an unsurpassed treasure containing gems precious beyond price.

With all these signs that medieval philosophic thought was coming to manhood we must bring our brief account of medieval philosophy to a close. In these very days of the twelfth, thirteenth and fourteenth centuries man's intellect was achieving other things that indicated even more surely that a new era in history had indeed commenced, that natural science was soon to begin as began of old the science of the Ionians; but these events belong to the rise of the age of discovery.

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CHAPTER XXI

THE AGE OF DISCOVERY

1. Introductory.—To call the fourteenth, fifteenth, sixteenth and seventeenth centuries the age of discovery is convenient, but arbitrary; for it cuts this era short at each end. On the one hand, the twelfth and thirteenth centuries really began the great era of discovery for they witnessed a genuine enlargement of the intellectual horizon in western Europe. On the other hand, the age of discovery has continued uninterrupted from the seventeenth century to the present time, for discoveries philosophically revolutionary have been witnessed by the eighteenth and nineteenth centuries and even already by the twentieth. Thus we may speak properly of the past eight centuries as the Age of Discovery in the broad sense, and accordingly of the fourteenth, fifteenth, sixteenth and seventeenth centuries as the Age of Discovery in the narrow sense. This fact that modern intellectual movements may be taken in both a broad and a narrow sense has two important aspects. First, it is an example of a general rule. Second, it requires us to study the history of modern thought not in terms of two or three centuries but rather in terms of movements that involve many centuries. I mean by calling this fact an example of a general rule that after a great historical movement starts, it characteristically keeps on, though in the meantime other great movements have started and have become more prominent. Thus the age of discovery has really never ceased since it began centuries ago, but in the meantime other

movements have come, and have taken the place of prominence. This overlapping of periods in the history of thought is somewhat like the succession of strata of different geological ages in the crust of the earth. That is to say, the age of discovery is one of the strata of the intellectual world of to-day, though we may speak of our time in terms of other more prominent strata. Since the sixteenth century other strata have been forming and these strata too have been built into our intellectual world so that the total intellectual structure of our age has within it fifteenth, sixteenth, seventeenth, eighteenth and nineteenth century formations. For example, the fifteenth century was famous for its interest in geographical exploration and discovery, but we have never ceased to be interested in such explorations even though we have become interested in many other things besides. As witness of this, recall the recent polar explorations attracting our widespread interest. The seventeenth century is distinctly naturalistic in its philosophical outlook, and naturalism has never since ceased to be a genuine part of our complex intellectual life. The nineteenth century witnessed a marked revival of romanticism, but romanticism had never entirely died since medieval times. The eighteenth century with its French revolution is famous for its political doctrines; and though our knowledge of man and of the state is far better and though our working hypotheses have become evolutionistic, still an immense amount of our political thinking remains distinctly of the eighteenth century type. Let us then be sure to keep this stratified structure of history in mind as we proceed with the present and the remaining chapters; for in a genuine sense we now commence to study our own time. The meaning of my second statement, that the study of the age of discovery will take us centuries back as well as centuries forward, though the centuries with which we associate the name

are the fourteenth, fifteenth, sixteenth and seventeenth, will, I hope, become evident as we proceed.

2. The factors giving rise to the age of discovery.— What gave rise to this remarkable period of discovery in western Europe? A detailed answer to this question would require a vast general historical treatise. However, our question calls for only the most prominent and general factors. Yet even such factors are numerous.

If we go back to the twelfth and thirteenth centuries as we must, we mark at once the important fact that western Europe was then coming in contact with important foreign cultures, the Moorish in Spain and Northern Africa and in the Levant the Moorish and the Greek. On the one hand, the Moors in Spain and on the other hand, the crusaders returning from the Levant, and the European travellers, sailors and merchants visiting the East were all bringing rapidly new customs, new thoughts, new learning and new arts into western Europe. Thus Europe's intellectual horizon widened. In particular, new interests were created in those parts of ancient Greek culture in which the Arabs were most interested and which they had preserved. This meant a new interest in astronomy, in mathematics, in physics and alchemy, in medicine and especially in the Aristotelian philosophy and science. But in addition the intercourse with Arab and Greek meant directly the widening of geographical knowledge and of the knowledge of the customs and interests of foreign peoples. This manifold widening of interest in the twelfth and thirteenth centuries was the genuine beginning of modern natural and mathematical science.

A second factor was the increasing interest in and appreciation of the ancient Latin literature. Heretofore the study of this literature had been tolerated only as " a robbing of the Egyptians by the children of God; " and accord-

ingly the ancient writings had received a forced allegorical and prophetic interpretation partly to excuse the impious interest. This budding interest in the classical writings for their own inherent excellence was to keep growing until in Italy it blossomed forth into the magnificent revival of classical learning in the fourteenth and fifteenth centuries. Italy was a favorable environment in which such an interest might grow. It was so for two reasons. First, the old Roman culture seemed to the intellectual Italian to be that of his own ancestors and to be his by right; and hence there was not only a natural interest but a far greater tolerance of such an interest in pagan pursuits. Moreover, what we may call the puritanism of medieval piety was least noticeable among the Italian peoples. Second, Italy's growing commercial intercourse with the countries of the Levant from the thirteenth century on and the easy means of travel between the Italian peninsula and the Levant were bringing the culture of the ancient Greeks as preserved in the East, into Italy; and thus by the fourteenth and fifteenth centuries the Italians had added to their intense interest in the Latin classics an equal interest in the classics of ancient Greece.

Still, the most important factor was the birth and growth of the spirit of nationalism, included in which are many subsidiary factors. Over medieval Europe there hung as a cloud the tradition of the Roman Empire and the power of the universal church with her centralized organization and her traditions. This cloud had to pass away before individual freedom of interests and of thought and before the spirit of nationalism could thrive. The story of the development of the modern nations is long and involved, but if it is to be put in a sentence or two, these should tell of the growth of economic Europe. The medieval community was economically self-sufficient. As towns grew trade grew. As trade increased, capital and wealth

increased. As these grew government and economic interests developed a partnership. As this partnership developed into policies, it consolidated national economic interests at home and gave rise to efforts to control markets abroad and to protect and to monopolize trade routes. The story of this growth includes a major part of the history of Europe from the days of Venice and Genoa to our own time. Its consequences were momentous not only for the development of nationalism as the political policy of modern Europe but also for the development of Europe intellectually especially in these centuries of discovery. In particular, it favored the rebellion against the medieval tradition. That is, it favored independent thought and radical changes in thought, and it favored the appeal to facts and to experiment. But more important perhaps than all of this, was the fact that great discoveries were involved in the very economic and political development itself. This development included the growth of the economic, or industrial arts; and it is characteristic that inventions in these arts precede the discovery of the principles of pure science by which the tools and methods of the arts can be explained. For example, we have already seen how far the practical arts had advanced in the Mediterranean period before any science began. As then the surveying of land preceded geometry as a science, and the use of fractions preceded the science of fractions; so in modern times the experience (that is, the trial and error processes of learning) of the artillerists preceded the scientific study of the paths of projectiles. In a sentence, modern physical science arose out of the practical arts. Again in a sentence, modern geography is the child of the crusades and of the medieval commerce precisely as ancient geographical science was the offspring of Punic and Greek commerce. Finally, chemistry, one of the youngest of the sciences, was preceded by extensive chemical skill in the factories

of Europe, and mineralogy and geology were preceded by the arts of mining and metallurgy.

For further study read:

Encycl. Brit., 11th ed., art. Roger Bacon; and arts. Astrology and Alchemy;

Thorndike, L., arts. on Bacon in Pop. Sci. Mo., 1915, and Philos. Review, 1914;

Cambridge Modern History, Vol. I, chapter XV.

For more extensive study read:

Roger Bacon Essays, ed. by Little, 1914;

Höffding, H., History of Modern Philosophy, 1900, Vol. I, 3–206;

Muir, M. M. P., Story of Alchemy and the Beginnings of Chemistry, 1903.

3. The course of discovery and the great discoveries: (a) "the revival of learning," or the discovery of the ancient culture of Greece and Rome.—As we have seen, the medieval intellectual man was trained in the Latin tradition as contained in the decadent culture of the last centuries of the western Empire. He was trained likewise in the church's tradition. Though both of these traditions contained elements of the culture of Rome and of Greece in their golden age, the pupil was viewing the ancient culture obscured and distorted as through a rough glass. That is to say, if he studied Virgil, he studied this author allegorically as a forerunner of Christianity and not as the true Virgil. If he studied Plato, he studied that philosopher as a Neoplatonist and not as the real Plato. In short, the true Greece and Rome were unknown and unappreciated by the typical medieval student of the ancient Latin authors; and therefore Europe had to discover the true ancient culture, as it were, to dig it up from beneath the debris of centuries. The discovery was beginning in the twelfth century, as we have seen, in the growing interest in pagan literature for its own merits. But the great dis-

covery came in the fourteenth century in northern Italy and came especially through the leadership of Petrarch (*fl. c.* 1345). At first the new interest was confined to the study of the books of pagan Rome and only later did it include the study of those of ancient Greece. Soon it included also the study of the art of the ancients and the desire to discover and preserve the monuments of their civilization. The result was that brilliant period of nearly two centuries which is usually called the Italian Renascence. This revival of learning included an astonishing mastery of the Latin and Greek languages and of genuine literary excellence in Latin writing. It included the birth of all that we mean by the term modern classical scholarship, the discovery of the lost manuscripts of the ancient writings, the editing of the ancient authors, the interpretation of their thoughts, the working out of the history of their institutions and culture, the discovery and preservation of their art and finally the development of a genuine appreciation and understanding of the ancient Mediterranean civilization. This renascence included also the marvellous development of Italian literature proper, which was to influence literature in France and to be the chief stimulus to the literature of Elizabethan England. From those days to our own, classical scholarship has progressed virtually without interruption; and from those days Greek and Roman thought, literature and art have continued to influence powerfully modern civilization.

For further study read:

Cambridge Modern History, Vol. I, chapters XVI and XVII;

Brandi, K., Das Werden des Renaissance, 1908;

Creighton, M., History of the Papacy, Vol. VI, Book VI, chapters I and II;

Beard, C., Martin Luther and the Reformation in Germany, chapter III;

Lindsay, T. M., History of the Reformation, 1906, Vol. I, 42–78;
Encycl. Brit., 11th ed., art. Erasmus.
For more extensive study read:
Sandys, J. E., History of Classical Scholarship, 1903–08, Vol. II, 1–370;
Robinson and Rolfe, Petrarch, the First Modern Scholar and Man of Letters, 2d ed., 1914;
Loomis, L., Medieval Hellenism, 1906 (Columbia University Doctor's Dissertation);
Burckhardt, J. C., The Civilization of the Renaissance in Italy;
Whitcomb, M., A Literary Source Book of the Italian Renaissance;
Emerton, E., Erasmus, 1899.

(b) **The discovery of Roman law.**—Back in the days of the eleventh and twelfth centuries Italian students began to discover the Roman law as that law obtained in the time of the great Roman jurists. The first study produced merely glosses, or the expounding of individual words in the Justinian text and was limited to the study of the Institutes. However, in a relatively short time the Digest was included and the glosses developed into genuine expositions of the law. Soon too a widespread interest in the study of the Roman law developed and the great law schools of Italy drew thousands of students from all parts of western Europe. From Italy jurisprudence spread to southern France and to Germany. In Germany especially the Roman law was appealed to wherever the local law failed specifically to cover the case before the higher court; and gradually the legal training which the study of the Roman law provided and the wider and wider use of the principles of this law in the courts made Roman law virtually the common law of the German states. In France the influence of the Roman law upon the common

law of the land was equally great. In England the development of the common law and equity seems at first sight to have been quite independent of the study of the great Roman jurists; but the influence of such study, though more hidden and though more general, was probably present. The fact that a great philosophic system of law existed and that this system was known and studied by the writers of the English text-books and by the students of the canon law makes any other inference seem improbable.

The details of modern legal development are overwhelmingly numerous. However, amid them all one fact stands out, from the days of the early Italian Renascence to our own, the study of the Roman law has been ordinarily a part of the training of the modern jurist.

For further study read:

Sohm, R. (transl. Ledlie), The Institutes of Roman Law;
Pollock and Maitland, History of English Law, 2d ed., 1909, Introduction;
Vinogradoff, P., Roman Law in Medieval Europe, 1906;
Maitland and Montague, A Sketch of English Legal History, 1915;
Jenks, E., A Short History of English Law, 1912;
Jenks, E., Law and Politics in the Middle Ages, 1898;
Maitland, F. W., English Law and the Renaissance, 1901;
Rashdall, Universities of Europe in the Middle Ages.

(c) **The geographical discoveries.**—In turning next to consider the geographical discoveries which began in the days of the crusades and reached their maximum extent in the fifteenth and sixteenth centuries and which have continued to our time, we come to one of the most powerful of the factors that revolutionized the thought of Europe. The detailed story of geographical exploration during the past seven or eight centuries and especially during the

middle part of that period does not concern us immediately. For our present purpose it suffices to point out the major parts of the story of man's becoming acquainted with the entire surface of the earth, with the people who dwell in all lands, with the customs and thought of savage and barbarian, with the flora and fauna of distant lands and seas and with the vestiges of extinct life and culture. We recall how medieval Europe was becoming acquainted with the eastern Mediterranean world, and even with the more remote East, Russia, Central Asia and India. The crusaders, the missionaries and the merchants of those days brought this to pass. In the fifteenth century Portugal, still under the spell of the crusader's ideal and of the desire to outflank the Arab and no doubt also in search of wealth, began to explore the western coast of Africa. In a few decades this enterprise led Portuguese sailors to the southernmost cape of Africa and beyond to the settlements of Arabian colonies on the eastern coast; and in 1497 the greatest feat of seamanship ever attempted began in the departure of Vasco da Gama from Lisbon for India. Then the Mohammedan was completely outflanked; and in a few years the Portuguese admirals with their far superior ships and seamanship commanded the Indian trade, and the old trade route *via* the Levant, with its costly and difficult methods of transit, had become hopelessly inferior to the ocean route. In the meantime the search for a direct western route to India, misled by the exaggerated estimate of the longitudinal width of the Euro-Asian continent obtaining since the days of Ptolemy, led to the discovery of America and by 1521 to the circumnavigating of the globe. The remainder of the story may be omitted, wherein Asia, America and Africa have been explored and added to the European world, and wherein the Atlantic Ocean has become to the modern what the Mediterranean sea was to the ancient world.

But the effect of these discoveries during the sixteenth and seventeenth centuries not only upon the commerce and politics of Europe but also upon the intellectual life of Europe can hardly be exaggerated.

Let us then put to ourselves the question: What were the most prominent effects of these geographical discoveries upon the thought of Europe? (1) There is the bald fact that they gave Europe a host of new interests, or subjects of thought. This alone implies that the new subjects competed successfully with the old and that the old interests became less prominent. And one of the evident facts in medieval thought was the almost exclusive theological interest. (2) But these new interests were not mere rivals of the old; for they raised numberless new and important problems, and they led men to correct numerous errors of the older learning. For example, to know the customs of other lands makes one critical of the customs of one's own land. To know the radically different thoughts and morals of other people makes one see that numerous principles which before were accepted as self-evident are mere assumptions. It was no accident then that the intellectual men of Europe two centuries after Columbus and Vasco da Gama questioned almost every institution, custom, religious dogma and moral principle of the medieval tradition, that they believed men are the mere product of their environment and that therefore environment if rightly chosen can make men perfect. It was no accident that they thought civilization an artificial structure and that the *natural* man as opposed to the *civilized* man formed the basic man of so many of their political, moral, religious and educational theories. (3) Finally, these discoveries filled parts of Europe with the very spirit of adventure and they made people more tolerant and expectant of change in every department of life. Picture the effect of these early discovered worlds upon the adventurous members

of the European population, an effect comparable to that of the discovery of gold in Australia, California and the Klondike. Picture the frequency with which extraordinary news must have been received in the busy seaports of western Europe and the growing response to novelty itself as a matter of course. True, these facts do not imply that all of Europe became radically minded or that any place became radically minded in all things. But they do imply that the geographical discoveries alone go far to explain the tremendous change that came as a matter of fact over the intellectual life of Europe in the course of the sixteenth, seventeenth and eighteenth centuries.

For further study read:

Cambridge Modern History, Vol. I, 7–36;
Jacobs, J., The Story of Geographical Discovery, 1902.

For more extensive study read:

Marco Polo, Travels, ed. by Yule, 3d ed., 1903;
Travels of Sir John Mandeville, ed. publ. by Macmillan Co.;
Beazley, C. R., The Dawn of Modern Geography, 1897–1906.

(d) **The astronomical discoveries.**—However, we do not depend solely upon geographical discoveries to explain the great change in Europe's intellectual life, for other discoveries, revolutionary in their effect upon man's thought, were soon added. These discoveries belong to the field of astronomy, physics and mathematical science, and physiology.

Any astronomical research that can be properly so called, had long ceased in the western Roman Empire when the middle ages began; and when astronomical research did begin again the new interest came through the Moors. In contrast with the absence of astronomical study in the West, there had arisen in the land of the Caliphs and under their patronage a remarkable interest in

astronomy as early as the eighth century. The Almagest of Ptolemy was translated and so also were the writings of other Greek astronomers. Careful observations were made and the observers seriously attempted to verify and to correct the results of the Greek astronomers. In addition, better instruments were constructed and some genuine though minor discoveries were made. From the East the study of astronomy was carried to the Moors of Spain, and from the Moors the interest in astronomy made its way into western Christendom and by the thirteenth century its presence was widespread in western Europe. In the first two centuries this western study of astronomy was limited to collecting and compiling such information got from the Greeks and Arabs as the students could themselves master; but in the fifteenth century a dawning independence in both study and research appeared; and by the year 1500 genuine progress had been made by manufacturing improved instruments, by observing more accurately and by adding to the older information minor discoveries and theories. But at this time and for many decades to come astronomy failed to shake off the prescientific superstitions so long associated with the study of the stars. Astronomers themselves remained astrologers and allegorists. Indeed, even as late as 1655 Huyghens, one of Europe's greatest astronomers and most enlightened minds, argued that inasmuch as the number of planets and satellites then known had reached the *perfect number twelve* there could be no more to discover! Still, beside this remnant of prescience we should put the record that the comet of 1472 was seriously observed as an object of scientific study and not as an object of superstitious terror.

With the first quarter of the sixteenth century we come to the most important event philosophically in the history of astronomy, if not to the most important event in the history of philosophy. Long before, the Pythagoreans

had suggested that the earth itself may move and later Aristarchus had suggested a heliocentric hypothesis; but these guesses had fallen on deaf ears, for the Greeks were never to outgrow the prescientific geocentric world. Now, however, influenced by the increasing complexity and difficulty of the traditional hypothesis and influenced by reading the ancient suggestions that the earth may move, Copernicus raises the hypothesis that "the apparent motions of the celestial bodies are to a great extent not real motions but are due to the motion of the earth carrying the observer with it." [1] That is to say, Copernicus had grasped firmly the principle of the relativity of motion and by the use of this principle he gave to his contemporaries a new scheme of the celestial world. He states this principle as follows:—"For all change in position which is seen, is due to a motion either of the observer or of the thing looked at, or to changes in the position of both, provided that these are different. For when things are moved equally relatively to the same things, no motion is perceived, as between the object seen and the observer."

"It has sometimes been said that Copernicus *proved* what earlier writers had guessed at or suggested. It would perhaps be truer to say that he took up certain floating ideas, which were extremely vague and had never been worked out scientifically, based on them certain definite fundamental principles, and from these principles developed mathematically an astronomical system which he showed to be at least as capable of explaining the observed celestial motions as any existing variety of the traditional Ptolemaic system. The Copernican system, as it left the hand of the author, was in fact decidedly superior to its rivals as an explanation of ordinary observations, an advantage which it owed quite as much to the mathemati-

[1] This and the following quotations are from Berry, A Short History of Astronomy, chapter IV.

cal skill with which it was developed as to its first principles; it was in many respects very much simpler; and it avoided certain fundamental difficulties of the older system. It was however liable to certain serious objections, which were only overcome by fresh evidence which was subsequently brought to light. For the predecessors of Copernicus there was, apart from variations of minor importance, but one scientific system which made any serious attempt to account for known facts; for his immediate successors there were two, the newer of which would to an impartial mind appear on the whole the more satisfactory, and the further study of the two systems, with a view to the discovery of fresh arguments or fresh observations tending to support the one or the other, was immediately suggested as an inquiry of first-rate importance."

The needs of the Copernican hypothesis as it left the hands of its author were two: first, further observations which would discover facts crucial to the rival theories; second, dynamical discoveries that would explain what in those days seemed the absurdities following from the new doctrine. In spite of continued progress in observation during the next fifty years the Copernican theory had to wait that long before it was definitely established as the preferable working hypothesis. The man whose discoveries wrought this mighty result and who himself deserves more than any other to be called the father of modern science and philosophy was Galileo Galilei.

Among Galilei's telescopic discoveries four may be mentioned as especially supporting the Copernican hypothesis. First, was the discovery of four satellites of the planet Jupiter and of their revolutions. This fully proved that great bodies could revolve about and follow another great body though the latter was itself moving through space at a high velocity, a doctrine that seemed

to the traditional thinker absurd and yet indispensable to the new hypothesis. Second, the discovery of the phases of Venus made its relation to the sun and its likeness to the moon and earth evident. Third, the discovery of the irregular surface of the moon, and fourth, the discovery of sun spots and through their motion the discovery of the probable revolution of the sun itself were fatal blows to the ancient belief in the changelessness of the heavens and added evidence of the similarity of the celestial and the terrestrial worlds.

Among Galilei's discoveries in dynamics were two of the utmost importance in giving modern Europe her cosmology. These were the laws of the acceleration of falling bodies and the principle that a moving body will if unimpeded move in a straight line with uniform velocity. They are themselves very simple and were discovered by means of very simple experiments; but they are the basis historically of the entire modern astronomy and mechanics, and they are the beginning of the greatest intellectual revolution man has ever witnessed.

Though the full account of the development of modern astronomy from Galilei to Newton, from Newton to Laplace and from Laplace to our own day includes numerous names and numberless details, it is astonishing how brief the story can be made. The discovery by Kepler of the paths of the planets and of the law that the line joining sun and planet sweeps through equal areas in equal times, and the discoveries associated especially with the name of Huyghens (resulting from experiments with the pendulum and with colliding bodies), these discoveries together with better mathematical methods and more accurate and more numerous astronomical observations made the astronomy of Newton possible. Through Newton Europe received the virtually complete basis for gravitational astronomy, that is to say, for a dynamical explanation of the observed

facts of the solar system. All that was essential to begin to extend this to the whole sidereal system was the later discovery of the revolution of double stars. The gravitational astronomy raised in the minds of a Kant and a Laplace the further problem of the origin of the solar system and led them to formulate the Nebular Hypothesis. This hypothesis may be largely speculative and only of secondary importance to astronomy, but its philosophical importance is immense. Thus within two hundred years of Galilei men not only could think of the solar world rigorously in terms of dynamics but had a dynamical theory even of its origin. To this stupendous achievement of the human mind the nineteenth century through the spectroscope has added the further achievement of giving us a physics and chemistry of the starry world and an easy method of ascertaining a star's approach toward us or recession from us and the velocity of this approach or recession.[1]

For further study read:

Berry, Short History of Astronomy, 76–409;
Höffding, History of Modern Philosophy, Vol. I, 103–148, 167–183;
Galileo, Dialogues Concerning Two New Sciences, transl. by Crew and Salvio, 1914.

For more extensive study read:

Ball, R. S., Great Astronomers, 2d ed., 1907;
Lodge, O., Pioneers of Science, 1893;

[1] Among the most prominent names of the fathers of our modern cosmology, so far as it is astronomical, are the following:—Copernicus (*fl. c.* 1515); Galilei (*fl. c.* 1605); Kepler (*fl. c.* 1610); Huyghens (*fl. c.* 1670); Newton (*fl. c.* 1685); Halley (*fl. c.* 1695); Bradley (*fl. c.* 1735); Kant (*fl. c.* 1765); Lagrange (*fl. c.* 1775); Laplace (*fl. c.* 1790); William Herschel (*fl. c.* 1780). With Herschel, the discoverer of the motion of double stars, and with the beginning of the nineteenth century our brief list must close as the names become too numerous and can be got best from a history of astronomy.

Whewell, History of the Inductive Sciences;
Clerke, A. M., Popular History of Astronomy in the Nineteenth Century.

(e) **The mathematical discoveries.**—As Greek astronomy was studied by the Arabs [1] and carried by them to the western world, so also was Greek mathematics. In transmitting to the West arithmetic, algebra, trigonometry and geometry the Arabs added little to the information they had received from their teachers, the Greeks; but they did thoroughly appreciate and understand the Greek mathematicians and so were themselves excellent teachers. This transmission took place in the twelfth, thirteenth and fourteenth centuries. In the fifteenth century the original writings of the Greek mathematicians were coming into western Europe directly from Constantinople, so that in this century both Greek and Arabic mathematics were easily accessible to European students. With the sixteenth century modern mathematics began; but this beginning may be summed up in the sentence, Greek mathematics was merely extended; whereas with the seventeenth century began that revolutionary development of modern mathematics which has brought the science far beyond the bounds of the Greek mathematical sciences. Most briefly summarized, the following five stages may be discerned in the history of modern mathematics since 1600: first the invention [2] and development of analytic geometry; second, the invention of the calculus; [3] third, the development of mechanics as an exact mathematical sci-

[1] The Arabs received mathematical information from the Hindoos also, especially the decimal notation of numbers.

[2] Especially associated with Descartes and the date 1637. *Cf.* Ball, A Short History of Mathematics, pp. 232 ff.

[3] Especially associated with Newton and Leibniz and the dates 1666 and 1674.

ence;[1] fourth, the development of mathematical physics;[2] and fifth, the immense development of pure mathematics in the nineteenth century.[3]

For further study read:

Ball, A Short History of Mathematics, 123–229, and espec. 230–410;

Cajori, History of Mathematics, 84–137, and espec. 138–403.

For more extensive study read:

Mach, E. (transl. McCormack), Science of Mechanics;

Cantor, M., Vorlesungen über die Geschichte der Mathematik.

(f) **The physical, chemical and physiological discoveries.**—From the late sixteenth century to the dawn of the nineteenth century was an age also of great discoveries in the realms of physical science and of physiological science, but especially in the former realm. Even the briefest summary of these numerous discoveries is beyond the scope of a paragraph. Suffice it then to say that besides dynamics, which, as we have already seen, becomes thor-

[1] Especially associated in its earlier stages with Huyghens and Newton and in its completion with Laplace and Lagrange, late in the eighteenth century.

[2] Commenced by Huyghens and Newton in their theories of light.

[3] Among the prominent founders of modern mathematics during the seventeenth and eighteenth centuries were the following:—Descartes (*fl. c.* 1635); Cavalieri (*fl. c.* 1640) who enunciated the principles of indivisibles, a forerunner of the integral calculus; Wallis (*fl. c.* 1645) who systematized and extended the methods and results of Descartes and Cavalieri; Pascal (*fl. c.* 1660) and Fermat (*fl. c.* 1641) with whose names is especially associated the theory of probability; Huyghens (*fl. c.* 1670); Newton (*fl. c.* 1685); Leibniz (*fl. c.* 1685); D'Alembert (*fl. c.* 1755) contributed especially to mechanics; Euler (*fl. c.* 1745) revised, systematized and extended analysis; Lagrange (*fl. c.* 1775) contributed to many branches of mathematics, especially to the calculus of variations and to mechanics; finally Laplace (*fl. c.* 1790) celestial mechanics and the theory of probability.

oughly established as a really complete science before the nineteenth century, the following sciences become established at least *in their beginnings* by the end of the eighteenth century, the sciences of sound, of optics and light, of magnetism and electricity, the science of chemistry and the science of physiology. Among the many discoveries that may be singled out as having had marked philosophical importance the following are a few: the discoveries that led to the Newtonian mechanics and gravitational astronomy (from Galilei to Newton); the discovery of the circulation of the blood and the related discoveries of glands and ducts in the mammals leading men to think of the living body as a machine (Harvey, 1628); the discovery of microscopic organisms (Leeuwenhoek, 1683); the discovery of the paths travelled by light leading to the formulation of the principle of least action (Snell, *fl. c.* 1630; Descartes, *fl. c.* 1635, and Fermat, *fl. c.* 1641); the discovery that light travels with finite velocity (Römer, *fl. c.* 1685; Bradley, *fl. c.* 1730); the discovery of the undulatory theory of light (Huyghens, Young); the discovery of the composition of white light (Newton, 1666); the discoveries gradually revealing relations between magnetism and electricity (Oersted, 1819); the electromagnetic theory of light (Faraday, 1845); the discoveries in chemistry that led toward the entertaining of the principle of the conservation of mass and of the atomic theory (Dalton, 1803); and finally the discoveries that step by step were leading men to conceive the notion of energy as an ultimate physical entity along with matter and to think of universal principles of energy. This goal is truly reached only in the nineteenth century in the discovery of the mechanical equivalent of heat (Joule, *fl. c.* 1850) and in the discovery of the principles of the conservation and dissipation of energy. These discoveries were in general related to the advancing knowledge in the science of heat, a science that

began with Newton but became thoroughly established only in the nineteenth century. (Carnot, *fl. c.* 1835; Mayer, *fl. c.* 1855; Joule, *fl. c.* 1850; Helmholtz, *fl. c.* 1860; Clausius, *fl. c.* 1860; Thomson, W., *fl. c.* 1865; Rankine, *fl. c.* 1860.) [1]

For further study read:

Whetham, Foundations of Science (The People's Books);
Cajori, F., History of Physics, 1916;
Thorpe, E., History of Chemistry, 1909, espec. Vol. I;
Foster, M., Lectures on the History of Physiology, 1901;
Encycl. Brit., 11th ed., art. Academies.

For more extensive study read:

Mach, E., Science of Mechanics;
Duhem, P., L'Évolution des Théories Physiques, 1896;
Whewell, History of the Inductive Sciences;
Ornstein, M., Rôle of the Scientific Societies in the Seventeenth Century, 1913 (Columbia University Doctor's Dissertation);
Dannemann, F., Die Naturwissenschaften in ihrer Entwicklung;
Gerland und Traumüller, Geschichte der physikalischen Experimentierkunst, 1899;
Miall, L. C., History of Biology, 1911.

[1] Among the numerous fathers of seventeenth and eighteenth century physical science (an acquaintance with whose names and work can be got from Cajori's History of Physics and Thorpe's History of Chemistry) I would call the attention of the student of the history of philosophy especially to the following: Galilei (*fl.* 1605); Gilbert (*fl.* 1580); Snell (*fl.* 1620, refraction of light); Descartes (*fl.* 1635); Torricelli (*fl.* 1640); Pascal (*fl.* 1655, pressure of liquids); Huyghens (*fl.* 1670, light); Boyle (*fl.* 1670, heat and one of the fathers of chemistry); Newton (*fl.* 1685, astronomy, light and heat); Römer (*fl.* 1685, finite velocity of light); Black (*fl.* 1770); Priestley (*fl.* 1775); Lavoisier (*fl.* 1785); and Dalton (*fl.* 1805) (fathers of chemistry); du Fay (*fl.* 1735); Franklin (*fl.* 1750); Cavendish (*fl.* 1770); Coulomb, Galvani, and Volta (*fl. c.* 1770) (fathers of science of electricity); and Young (*fl.* 1815, undulatory theory of light).

(g) Psychology and political and social science.— From the sixteenth century human nature, individual and social, has been the object of most intense study. This study, however, has been slowest in outgrowing the preconceptions and the prejudices inherited from the middle ages, and has only gradually changed from a speculative argument into a genuinely inductive or experimental research. Indeed it had not succeeded in so doing until late in the nineteenth century. In the sixteenth, seventeenth and eighteenth centuries, therefore, this field of study was far less a field of verified discovery than was the field of physical science. Rather it was a field of growing insight and enlightenment amid partisanship and inherited conceptions. However, it would be grossly misleading not to emphasize the vast importance of this speculation in the practical and philosophical life of the western world. By hard thinking and by a growing insight into the nature of man, society and the state theorists themselves outgrew and enabled intellectual men to outgrow medieval psychology and political, social and economic theory. In short, great thinkers led the thought of Europe through the mighty political, economic, social and educational changes which the past three centuries have witnessed, through the age of absolute and autocratic government and education to the days of constitutional monarchy, democracy, humanitarian legislation and utilitarian education.

Long and complex as is the detailed story of the growth of these sciences during the seventeenth and eighteenth centuries a few major facts stand in relief and are philosophically most important. The prescientific and religious conceptions of man's mind and of human society and political institutions were quite outgrown by the great thinkers of these two centuries. But the resulting secular beliefs were far from well founded. These beliefs were

still in principle the beliefs of the Greek thinkers. Man's mental nature was not really understood and could not be until Darwinism revealed the relation of man's mind to that of the brutes, until the physiology and the microscopic anatomy of the nervous system gave some insight into the working of the human mind, and until experimental research began in psychology. Before this time psychology had to remain a more or less artificial analysis of consciousness, a system of guesses by clever introspectionists, and a series of speculations by enlightened students of human life. The most important discoveries made were the rôle played in education by the process called the association of ideas, and the enormous extent to which the adult mind of man is the product of environment. On the one hand, these discoveries favored the growing liberalism, empiricism, and subjectivism in philosophic thought, as we shall see in later chapters. On the other hand, they tended to make thoughtful men outgrow the older Greek belief in the *consensus gentium*, in the law of nature and in general in a universal God-given philosophy implanted in man's mind at birth.

During these centuries society continued to be thought of as an artificial conventional organization, founded in fact or in principle by a contract between its members. It continued to be thought of as based logically upon "the law of nature," and as essentially a rational enterprise. In short, it continued to be conceived in principle as the Greek thinkers of old would have conceived it. This had to be so, until the modern thinker became an evolutionist, until he understood better the instinctive nature of man and brute and until through a wider acquaintance with fact he won some insight into the real factors at work in the origin, development, and transformation of society, of governments, of economic customs and institutions, and of jurisprudence. And this knowledge really began

to come to students of human nature and society only in the nineteenth century.

For further study read:

Cambridge Modern History, Vol. I, 198–218;
Lecky, Rationalism in Europe, chapter V.

For more extensive study read:

Dessoir, M. (transl. Fisher), Outlines of the History of Psychology, 1912;
Klemm, O. (transl. Wilm and Pintner), History of Psychology, 1914;
Dunning, W. A., History of Political Theory from Luther to Montesquieu, 1905;
Sidgwick, H., The Development of European Polity, 1903;
Gooch, G. P., English Democratic Ideas in the Seventeenth Century, 1898;
Scherger, G. L., The Evolution of Modern Liberty, 1904.

4. The broadening of the field of discovery and of science.—A most important aspect of the development of science in the seventeenth and eighteenth centuries is the ever widening and rapidly widening field of man's scientific interest. This can be seen by comparing the limited field of research in the days of Galilei with the wide field of research two centuries later. In the age of Galilei anatomy, botany, physiology, psychology and political theory were merely beginning, so was chemistry, so were dynamics and physics, mathematics and astronomy, that is, they were merely beginning as modern sciences. And at first the problems which they raised were few and relatively narrow. Whereas by the end of the two centuries many of these sciences had become widely extended and well established; and in addition several new sciences had commenced as modern sciences, such as mineralogy, geology, paleontology, anthropology and economics.

But extensive as had become the field of science by the era of Napoleon it seems narrow indeed when compared

with the field of science to-day; for this widening of the field of science and this enormous multiplication of the problems and the departments within the major sciences has continued in almost geometrical progression during the nineteenth century. With the exception of the mathematical sciences, we may even say that the other sciences had merely their beginning in the seventeenth and eighteenth centuries. Wonderful as were these centuries they but led to a far more wonderful period of rapid scientific development, the past one hundred and fifty years.

5. The conflict of science with prescientific and medieval belief and custom.—From the days of the sixteenth century the new learning, the new discoveries and the new theories have often come into bitterest conflict with the older beliefs and customs. The new anatomy and physiology and the new astronomy were at the beginning bitterly opposed as heresy. Galilei was condemned by the Inquisition and compelled to deny that the earth moves. From the days of Galilei the struggle toward a frankly scientific conception of all that concerns on the one hand cosmology, and on the other hand man's origin, his history, his nature, his place in the cosmos, his morality, his political and social institutions and his religion has met with bitter opposition. One battle after another has been won by science over prescience, in period after period, until the present time, when we feel that the struggle is past. But in so feeling we should not forget that only yesterday the Darwinian theory had a bitter struggle to win men from older beliefs and that to-day Biblical science is still in the midst of a similar struggle. If then we say that science has in general won the recognition of her right to be, let us not fail to qualify this assertion by the statement that science has still much work to do to win the western world entirely from prescientific belief and custom. Yes, there still remains unfinished the task of

educating even the intellectual classes to a genuinely and completely scientific attitude toward all problems open to scientific research.

For further study read:

Bury, A History of Freedom of Thought (Home University Library);

White, A. D., History of the Warfare of Science with Theology in Christendom;

Lecky, W. E. H., History of the Rise and Influence of Rationalism in Europe;

Burr, G. L., Witch Persecutions, 1896;

Schaff, P., The Progress of Religious Freedom as shown in the History of Toleration Acts, 1889.

CHAPTER XXII

THE MODERN PHILOSOPHICAL MOVEMENTS

1. Introductory.—Already in the sixteenth century the age of discovery was beginning to witness great philosophical changes in the intellectual life of Europe. Common to these changes was a revolt against a large part of the medieval conception of the world, of the state and of life. First, was the revolt against medieval thought and feeling and art seen in the revival of classical scholarship. Second, was the rise of nationalism and of the doctrine of the supremacy of the state over the church. Third, was the religious and moral revolt seen in the Protestant rebellion against the medieval church and in the effort of the church to reform herself from within. Finally, was the revolt against medieval science and thought that may be called anti-aristotelianism. This last revolt included the rejecting of the ancient astronomy and physics and the rising of experimental research and exploration with their spirit of self-confidence and independence of authority.[1]

However, we shall do well to begin our account of the first great philosophical movement of modern times as that movement appears in its full strength in the seventeenth century, and thus confine our story of modern philosophical development to the past three hundred years.[2]

[1] It included also some attempts to find through speculation at once a new conception of the world and of life. One of the most celebrated of these attempts was the naturalistic pantheism of Giordano Bruno (burnt at the stake in Rome by order of the Inquisition 1600).

[2] Here a statement previously made, warrants repeating. In our study from this point on we begin to present literally the philosophi-

For more extensive study read:

Cambridge Modern History, Vol. II, chapters IV, VII, IX–XII, XIX;

Burckhardt, The Civilization of the Renaissance in Italy, Part III;

Lindsay, T. M., History of the Reformation, 1906;

Beard, C., The Reformation of the Sixteenth Century in its Relation to Modern Thought and Knowledge (Hibbert Lectures, 1883).

2. The survival of prescientific thought.—Before mentioning the first of these modern movements I must stop for a moment to point out that which has changed least, that which has remained still the basis of our intellectual life. In the middle ages European thought and custom were almost entirely prescientific and barbaric and with the coming of science and of critical thought this barbarism did not immediately disappear nor has it yet completely disappeared. Thus to this very day an underlying stratum of barbaric and prescientific thought, belief and custom remains in many parts of our social, political, religious and intellectual life.[1] The preceding chapter has pointed out

cal thought of to-day; for though one movement has been followed by others, the older movement has also remained as a permanent force in the combined or resultant movement. Thus it is distinctly advisable to present modern philosophy in terms of movements instead of periods. Moreover, in so doing we shall not neglect altogether the fact that there have been periods, because we shall take each movement up in the order in which it began to make itself clearly powerful in modern European thought.

[1] Here I refer even to the intellectual classes. The non-intellectual majority are of course prescientific in most matters of life. Any barbarian can board a railway train and ride on it or can use the tools and methods of civilization without understanding a steam engine or the principles of mechanics, or without being much wiser than his medieval forefathers. Hence the fact that the masses use modern tools and go to modern hospitals and graduate from the elementary schools does not imply that a revolution has taken place

the intense struggle that modern science has had to wage with the group mind and the inertia she has had to overcome wherever she has asked the group to change some old or primitive belief and custom. And to this fact we may add that myth, magic and animism are to this day part of the bottom stratum of European thought. For example, animism is still widespread in our interpretation of human life and thought; magic is still an important part of popular medicine; the criminal is still thought of much as he is conceived by the barbarians; the methods and curricula of our schools and colleges still presuppose prescientific theories of the mind and of its ways of working; ethics and religion, even among the intellectual classes,[1] still manifest much that is distinctly primitive. All of this is said in no spirit of criticism or of impatience but simply as a statement of important historical and psychological fact. No epoch in the most civilized of peoples has failed to exhibit a vast substratum of the primitive in their thoughts and customs and beliefs; and as far as we can foresee the history of human society such a vast primitive substratum will continue to be present.[2] Indeed, to explain the mind

making them intellectually superior to prescientific man. In short, an examination of the intellectual attainments, or of *the philosophy of the average man to-day*, would reveal a prescientific man, a prescientific man not in the arts and tools he uses but *for the greater part* a prescientific man in the comprehension of his environment and of himself.

[1] The term "intellectual class" is of necessity ambiguous. We might arbitrarily define it as that ten per cent of the population which is most intellectual and best instructed. If we made it twenty-five per cent the barbaric element in modern thought would be vast. Even if we made it one per cent the statements made above would probably remain true.

[2] My ground for this last assertion is the psychological belief that at least seventy-five per cent of the population has not the *innate* intellectual capacities really to acquire a good secondary school training in science, at least not by our present methods of instruction.

of any modern thinker we have to presuppose instincts but little modified by instruction, subconscious traits but slightly integrated with the system of thoughtful procedure and habits socially and blindly inherited through the inert group-mind of the society in which the thinker has been reared. Moreover, scientific research never has as its field of exploration the universe, or the totality of possible objects of study, but makes its way slowly from some center of interest to other centers and so but gradually lengthens the diameter of its total field of study. In the meantime much that remains without the field of science is conceived, even by intellectual men, in prescientific and socially inherited ways.

Hence in beginning to study the modern philosophical movements which during the past three hundred years have been forming the philosophical thought of to-day and *have been indeed causing immense changes in our intellectual life*, let us not forget this vast substratum to our thought, a substratum that has persisted through the course of ages and that is in part at least older even than the middle ages. This is the first stratum of modern European thought and on it rest the strata built by the great forces and disturbances, the stresses and strains, the erosions and deposits that figuratively speaking have brought about modern progress.

For further study read:

Lecky, Rationalism in Europe;
White, Warfare of Science with Theology.

3. The modern philosophical movements.—Two major philosophical movements reveal themselves in the development of modern religion and thought; first, the medieval romantic or mystic movement which for a few centuries, and especially during the seventeenth and eighteenth centuries, was in a sort of abeyance but which became

prominent again in the nineteenth century; and second, the scientific, classical or intellectualistic movement which had become prominent by the close of the sixteenth century and which remained most powerful during the seventeenth and eighteenth centuries.

These two movements differ fundamentally. In origin, romanticism is medieval, northern and Christian; intellectualism is classic, Mediterranean and pagan. Emotionally, romanticism is filled with a sense of man's imperfection and helplessness, with fear and love, with the feeling of the need of self-discipline and with a feeling of the essential mystery of life. In contrast, intellectualism is filled with a confidence in man's perfectibility and power of self-help, with a zeal for humanitarianism and for the amelioration of human fortune, with little sense of sin and with little appreciation of humility and spirituality. Intellectually, romanticism has little interest in theory, in the exact sciences, in the general and the abstract; whereas intellectualism is confident of theory, is rationalistic, and is optimistic regarding man's ability to explain and to understand the world, man and his place in the world. Religiously, romanticism is mystic, is filled with love, gentleness and humility, is other-worldly and essentially pessimistic. In contrast, intellectualism is optimistic, worldly and naturalistic. In politics, romanticism is evolutionistic and often reactionary, whereas intellectualism is revolutionistic, democratic and utopian. Romanticism has a deep interest in history and the past, whereas intellectualism is interested in the future and is forgetful of the past and its own indebtedness to the past. In art, romanticism gives expression to its wealth of religious emotion, to its love of nature, history, and the lowly life of the peasant, to its interest in human love and passion, and to its enjoyment of rich sensory experience. In contrast, intellectualism is classic, favors order and

form and purity of style, is interested in the city and its life, and is distinctly non-emotional.

In philosophical thought intellectualism and romanticism differ correspondingly. Intellectualism is confident of man's power to explain and to understand the world and himself, for the world is essentially a world that can be understood. It is a naturalistic world, a world that can be explained in terms of science. It is a rational world, a world whose grounds can be discovered and whose modes follow logically from these grounds. In short, it is a world that can be logically deduced from principles. Again, it is a world of law, or causality. Its laws have no exceptions. There can be no miracles, no mysteries and no indeterminate factors. Whatever happens has to happen and under the same conditions the same thing always comes to pass, and these conditions can be discovered. Finally, to the intellectualist it is a world of mathematical and logical necessity. It is not a teleological world. It is not governed by outside agents nor is it designed for some end. Man and his interests play but an infinitesimal part in its infinite history. It is a world for hard-headed rational men and not for sentimentalists.

To the intellectualist man's mind and human society are likewise rational and natural. They are fundamentally no more mysterious than is the solar system of which they are inhabitants. Science can therefore explain both mind and society and deduce their nature and states from the same principles by means of which other forms of existence are explained. The ideal life of man and of society is accordingly a worldly life and a rational life. Man's interests begin and end here upon earth. His supreme desire should be to make the most of what a command of nature and of himself through science renders possible. He should be governed by reason and so should society; for society is fundamentally a contract between rational

men who should accordingly live true to that contract and secure to each his fundamental rights. In short, the great enterprise of man morally, socially and politically is the happiness and well-being of each member of society.

Intellectualism has been essentially optimistic. Its note was sounded by Francis Bacon. "He was not himself scientifically trained, and in many respects, especially owing to his ignorance of mathematics, he radically misinterpreted the methods and ideals of the new science. But he prophetically expounded, in speech of magnificent power, a new vision of human possibilities upon the earth. He taught that knowledge, scientific knowledge, is power. In virtue of man's intelligence man has a creative capacity, to which no limits can be prescribed, a power of subordinating nature, and of taking the destiny which hitherto nature has controlled into his own hands. If, as it seemed to the archæologists of that time, the Greeks may be said to have created the arts, the moderns, according to Bacon, were destined for the still greater task of recasting the entire economy of human life.

"The beginnings of the next step appear in John Locke. Bacon's vision had been limited to the material conditions of human existence. Locke applied the same free and forward-looking analysis to its political and educational aspects. And the seed which he sowed, slowly maturing, came to sudden flower in what have very fittingly been named the Enlightenment philosophies, the philosophies of the Encyclopedists and Rousseau. They taught that by the radical recasting of social institutions and by the development of new and better educational methods, human life may be transformed into something very different from, and immeasurably superior to, all that it has hitherto been. The future will be related only through contrast to the past. As Godwin, an enthusiastic sup-

porter of this teaching, declared in his *Political Justice:* 'Nothing can be more unreasonable than to argue from men as we find them, to men as they may hereafter be made.' " [1]

The seventeenth and the eighteenth centuries constituted the era during which intellectualism was most prominent and these centuries witnessed as the greatest achievements of intellectualism, on the theoretical side, the rise and development of mathematics and mechanics, the nebular hypothesis, the associationist psychology and the contract theory of society, and, on the practical side, the French Revolution and the vast moral, social and political influences throughout Europe and America which sprang from that tremendous event. The main stages of the development of intellectualism appear in Francis Bacon, John Locke, the English Deists, Voltaire, the French Encyclopedists and Rousseau. It culminated in the Enlightenment, in the "Age of Reason."

"The Enlightenment is well named, and deserves more credit than we, who have profited by its labors, and can criticise its earlier manifestations, are usually prepared to admit. Its influence seems even more fundamental and far-reaching than that which has been exercised by the evolution theories propounded by Darwin. It is the specifically modern standpoint. It is the type and norm of every philosophy which seeks to justify the methods and doctrines by the future rather than by the past. It is also the legitimate offspring of the classical tradition. For it expresses, under the altered conditions of modern life, and in view of the powerful weapon which modern science has placed in men's hands, the same free self-assurance that inspired the Greeks in the upbuilding of their civilization. It expresses the same conviction of the supreme value of

[1] Norman Kemp Smith, The Middle Ages, the Renaissance, and the Modern Mind, Hibbert Journal, 1914, *12*, 545 f.

intellectual enlightenment as the chief agency of human progress." [1]

Romanticism, in contrast, has given the modern world a markedly different philosophy. Romanticism has sought chiefly to accomplish two things, to save the Christian religion from atheistic naturalism and to revive the emotional and spiritual life dominant in the middle ages. On the one hand, it has endeavored to outflank naturalism by idealism. On the other hand, it has attacked naturalism in front by endeavoring to show that the world of experience is not the world of science.

In idealism, romanticism has exalted the part played by the mind in experiencing the world. Taking its premises from Descartes and ultimately from St. Augustine it showed the central position occupied by the mind and personality of the thinker and argued that the world is mind-made and mind-constituted. That romanticism could thus outflank intellectualism was due to an extremely weak point in the breastwork of naturalism, its dualism of matter and mind, its resulting inability to explain the mind naturalistically, and its own tendency to adopt the phenomenalism of Democritus. Idealism first appeared in the early eighteenth century in the writings of Berkeley and received its most famous expression in those of Kant, Fichte, Hegel and Schopenhaur.

But romanticism has made a direct attack upon naturalism. This attack has taken the form of extreme empiricism and emotionalism. Science is abstract and general, reality is concrete and unique. The entire scheme of science is an extreme over-simplification of the wealth, variety, complexity and essential dynamism of the world. Reality has to be experienced, intuited and felt. It cannot be understood. It can at most be described. The world is neither

[1] Norman Kemp Smith, The Middle Ages, the Renaissance, and the Modern Mind, Hibbert Journal, 1914, *12*, p. 546.

logical nor mechanical, but is a world of quality, intensity, spontaneity and life. Reality defies the rigor and the fixity of scientific concepts and its manifold contents cannot be reduced to mathematical entities. And the proof of all this is man's direct experience of nature and of life. It is empirical proof and it rejects altogether the principles and the conclusions of rationalism. This empiricism was already evident in the writings of Berkeley but it came to fuller expression in the romanticists of the nineteenth century.

But part of this proof got from experience is the verdict of the emotions. Man is not fundamentally rational. Rather he is fundamentally will, feeling and instinct. His true interest in the world is not science but the moral and the spiritual life. The world is not a puzzle to be solved but a cause to be won or a life to be led. This appeal to the feelings and sentiments was made first in such religious revivals as methodism in England and pietism in Germany. Its most famous expression is to be found in Rousseau and in the great German thinkers whom he influenced, Kant and Fichte and again in the romantic poets and literary writers of England, France and Germany in the late eighteenth century and the early nineteenth century.

For further study read:

Kemp Smith, N., The Middle Ages, the Renaissance and the Modern Mind, Hibbert Journal, 1914, *12;*
Paulsen, F., System of Ethics, 126–168, 169–215.

4. The course of modern philosophical movements and the philosophical tendencies of the nineteenth and twentieth centuries.—We are now prepared to correlate two matters, which correlated are immensely significant to the student of modern philosophy. On the one hand, intellectualism was reaching its full power already in the days of Galilei, Bacon and Descartes and retained this

power until the passing of the French Revolution and "the Age of Reason," that is, until the fall of the Napoleonic Empire in the early nineteenth century. On the other hand, as has been shown in the preceding chapter, modern science began in the days of Galilei but, with the exception of mathematics, mechanics and the gravitational astronomy, did not really pass beyond its embryonic stages until the nineteenth century. *Hence the intellectualism of the seventeenth and eighteenth centuries was modern in so far as it was based upon the new astronomy and mechanics but for the rest it was not modern at all, rather it was Greek.* Put more precisely, the philosophy of the seventeenth and eighteenth centuries was that of Democritus revised in the light of the new astronomy and mechanics with much of the Stoic moral, social and political philosophy added. In short, the Copernican universe, the Newtonian mechanics and the resulting philosophy are modern; but with this exception the modern world has lacked a philosophy based on its own discoveries and its own experience, or at least has lacked such a philosophy until the nineteenth century. Whether or not the nineteenth century has been witnessing the rise of a truly modern philosophy, is a difficult question for the historian to answer, not only because he is still too near the thought of the past one hundred years but also because these hundred years of rapid scientific growth seem to be only the beginning of a still vaster growth to come. However, if a truly modern philosophy is there to be found, it must be sought in the philosophical movements since the time of Darwin, that is, in the past fifty years. I believe that such a modern philosophy is to be found in romanticism, in the evolutionistic philosophy, in pragmatism and in the new realism.

But let us return to the time of Galilei and trace briefly the course of modern philosophical development: The intellectualistic movement of the seventeenth and eight-

eenth centuries gave rise first to a naturalistic mechanical world-hypothesis and to a distinctly rationalistic method of solving the problems of nature, life, mind and society.[1] Moveover, this older intellectualism contained within it a fundamental and unavoidable difficulty inherited from the ancient world, its dualism between mind and matter and the resulting phenomenalism. This difficulty commenced to make itself evident already in the thought of Descartes and John Locke, in the seventeenth century. In some of the successors of Locke, it led directly either to extreme subjectivism (Berkeley) or to an agnostic phenomenalism (Kant). The English followers of Berkeley transformed his doctrine into a subjectivistic positivism and the German followers of Kant transformed his phenomenalism into a romantic spiritualism, or idealism. Thus the dualism of Descartes has had at least three offspring, phenomenalism, subjectivistic positivism and idealism. The two former have kept closer to the original intellectualism from which they sprang; whereas the latter has been predominantly romantic.[2]

The next movement, largely scientific and intellectualistic in origin but also in no small measure romantic in origin, was the evolutionistic movement. It belongs preeminently to the nineteenth century. Its most important achievements were the rise of historical research and the geological and biological theories of evolution. Next to the earlier intellectualism it has been one of the most powerful factors in modern philosophic thought.[3]

Almost contemporary in origin and development with the evolutionistic movement, influencing it and influenced

[1] These tendencies, especially of the seventeenth and eighteenth centuries, constitute the subject of chapter XXIII.

[2] These subjectivistic doctrines and their consequences constitute the subject of chapter XXIV.

[3] The doctrine of evolution is the subject of chapter XXV.

by it, arose the romantic movement. Romanticism began to appear in the eighteenth century but received its fullest expression in literature, art, religion, and thought during the nineteenth century.[1]

Finally, besides the evolutionistic and romantic movements further reactions against the older intellectualism have arisen. These further movements, while remaining themselves intellectualistic, have given expression to a deeper insight into the nature and results of modern science and have led some thinkers to re-examine and reject the very basis of the Greek philosophy and so the basis of the seventeenth and eighteenth century intellectualism and its subjectivistic consequences. Whether or not these new movements will unite with the romantic movement and so form a thoroughly modern philosophy remains a question for the future to answer.[2]

Thus the philosophic thought of the present time is extremely complex. In it are to be found all the modern movements from those of the sixteenth century to movements that are now in their infancy. However, complex as it may be, let us remember that it contains fundamentally but the two movements, intellectualism and romanticism.

[1] The romantic movement is the subject of chapter XXVI.

[2] Recent and present philosophical tendencies are the subject of chapter XXVII.

CHAPTER XXIII

RATIONALISM AND NATURALISM

1. The problem of method.—At the end of the sixteenth century and the beginning of the seventeenth great interest arose in the *method* of winning the new and vast information which all intellectual men seemed convinced was on the verge of being discovered. As we look back upon those days we see that Galilei [1] was already master of the method of research which has proved so fruitful in the succeeding centuries, the experimental method. This method distrusts traditional belief, mere argument and appeal to authority and bids us go to the facts, study them and through them verify our hypotheses.[2] But the method is far more than an appeal to fact, for it is also experimental. It bids us invent or discover an hypothesis that will account for the known facts and then deduce from our hypothesis further as yet unobserved facts and finally verify our hypothesis by ascertaining either through further observation or through experimental enquiry whether or not these deduced facts are indeed facts. More-

[1] The same may be said of William Gilbert, the father of the science of magnetism.

[2] The same necessity that the searchers after truth observe facts and employ experiments was voiced also by the great English thinker, Francis Bacon; but Bacon was far less aware of all that is required by the experimental method than were Galilei and Gilbert and besides was not able, as were they, to put the method to use and to demonstrate by wonderful success the worth of the method. Moreover, Bacon quite undervalued the experimental work of these two masters of experimental research.

over, the method is experimental by being analytical. It bids us endeavor to isolate artificially both facts and problems or to seek out facts isolated in the world about us. By so doing we may greatly simplify the exceeding complex intermixture of causes and effects present in the ordinary happenings and objects of nature and may be enabled to study the individual cause and its specific effect or to study the individual effect and its specific cause.[1]

Though experimental enquiry became rapidly in the seventeenth and eighteenth centuries the tradition of European physical science and spread gradually from one field of study to another;[2] we must hasten to add that this was but the beginning and not the end of a mighty movement in science and that most European thinkers still held to a radically different philosophy and method. Moreover, in those days most thoughtful men believed the goal of universal and infallible knowledge to be not far distant; and though they fought Aristotelianism they were themselves still Aristotelian. Hence under the spell of a growing and triumphant mathematics and mathematical dynamics they hoped soon to give the world a deductive, universal and infallible science. In short, they were extreme intellectual optimists.

Let us consider briefly the essential character of a deductive, universal and infallible science. If we are to have a science that is final, universal and deductive; we must first discover all the premises needed; and if we are to discover these premises quickly, they must not only be

[1] Of course the experimental method requires also the invention of more and more delicate and accurate instruments of research and more and more precise and elaborate technique in observing and experimenting.

[2] Of course this method is in principle as old as civilization itself and especially as old as science; but never before in the history of man was it elaborated and deliberately practiced as it has been since the days of Galilei.

easy to discover but be few in number. Again, if we are to have a final, or infallible science, our premises must be true; and we must be able to know that they are true. Now it was characteristic of even the radical thinkers of the seventeenth and eighteenth centuries to believe that these requirements could be easily met and were actually being met by them, and therefore to believe that science would soon become a distinctly non-experimental procedure. The chief reasons for their so believing are easy to discover. (1) As compared with the vast amount of information possessed by man to-day they were relatively speaking extremely ignorant; and the more ignorant man is, the simpler is the world to which he responds, that is, the simpler the world seems. In short, to them the world seemed far simpler than it does to us. (2) They were new at experimental research and had not yet had time to learn that experimental research usually discovers problems faster than it solves problems; in other words, that the more we learn the more we discover there is to learn. (3) They were making brilliant discoveries in the fields of mathematics, celestial mechanics, dynamics, and the dynamical aspects of human physiology, or briefly, in pure and applied mathematics; and so it was natural for them to identify mathematical science with science as such. Hence they ascribed to science as such the marked characteristics of pure mathematics and mechanics. Now, at least as they conceived mathematics, these marked characteristics were, a few infallible axioms, a few postulates, a few definitions and then a rapid and elaborate deduction of the remainder of the science. Therefore it is not astonishing that the universe conceived by them to be a mathematical machine, completely explicable in terms of a relatively few mathematical presuppositions, should seem an object which the man of research might quickly exhaust experimentally and for which he might

quickly discover a universal, infallible and deductive science.

Thus the problem of method became a matter of great interest in these centuries and received two conflicting solutions. On the one hand, Galilei and, in a lesser degree, Bacon were teaching Europe the method of experimental enquiry and its marvellous possible achievements. On the other hand, the French philosopher and mathematician Descartes was telling Europe about a method that is mathematical and deductive. And, both parties were genuine spokesmen of the progressive scientific spirit of their age.

We have now formulated the most prominent characteristics of the two methods. Let us next briefly describe some important details of the method of Descartes as a remarkable example of the deductive method and in general of the rationalistic movement. (1) Descartes indicates his desire not merely for universal information but also for its rapid attainment. Moreover, he expresses the hope of attaining it with certainty, or infallibility; and he reveals the basis of this hope by telling us that he has been deeply impressed with the certainty and finality of geometry. This certainty of mathematics he easily reduces to two facts, the certainty of the premises, or axioms and the certainty of deductive inference. But whence comes the certainty of the geometrical axiom? Descartes answers: Whatever the mind clearly and distinctly perceives to be true is certain; or translated into the language of mathematics, we get all our axioms by intuition of which mathematical intuition is the best known instance.[1] As we ordinarily believe, we can see

[1] Of course at the present day we know more regarding mathematical intuition than did Descartes. We know that it is built up by training as is any other intellectual habit and can be extremely misleading and erroneous. Moreover, pure mathematics to-day does

intuitively that a straight line is the shortest distance between two points, or that the whole is equal to the sum of its parts. (2) Thus precisely as intuition seemed to Descartes to furnish the sufficient and necessary conditions for geometry, so intuition, he believed, can furnish science the requisite premises for deducing the entire nature of the universe, or for explaining everything. That is to say, man's intuition, or his ability to perceive clearly and distinctly, enables him to discover the infallible truths which are requisite not only for physical science and mathematics but also for morals, politics and religion. (3) These intuitions, or at least the capacities upon which they depend, are inborn and universal among men. They are "innate ideas," and so we have innate ideas which enable us to deduce mathematics, physics, morality and religion. (4) But in the interest of orthodox religion which claims to be a revelation from God and therefore to be a doctrine that man cannot get through his own intellectual search, morality and religion are divided into two departments, natural and revealed. Natural morality and natural religion can be deduced from man's innate ideas; but of course revealed religion and revealed morality come to man only through the Church.[1]

This rationalism was no doubt a lineal descendant from the scholastic philosophy of the medieval thinkers; and it indicated, as I have mentioned, that though experimental research had begun in certain limited fields of science it had not commenced universally. Further, it indicated that the extension of experimentalism as a method was to be a gradual and slow process requiring centuries to make

not assume the certainty of its postulates. In Descartes' time and until recent decades, however, the mathematician did so.

[1] The most famous rationalistic philosophers of the seventeenth century were: Hobbes (*fl. c.* 1630); Descartes (*fl. c.* 1635); Spinoza (*fl. c.* 1670); and Leibniz (*fl. c.* 1685).

its way into all fields of thoughtful study. That is to say, rationalism is science based largely on socially inherited, or acquired prejudices which we euphemistically call axioms and is therefore necessarily present in the early stages of any science when the known facts belonging to the field of this science are quite inadequate to test thoroughly our theories. It may be called the groping stage of a science. Hence until man learned, what has proved to be an extremely difficult lesson, that what is possible in mathematics may for decades and centuries to come be impossible in the complex existential sciences, such as physics, chemistry, biology, psychology, and sociology; he was disposed to believe optimistically that a little thought could make these sciences thoroughly deductive.

Such being the case, one of the most important matters in the history of modern philosophy is *the order* in which the various sciences have become experimental. In general, the physical and chemical sciences and astronomy became rapidly experimental, or inductive. Next in order have come the sciences, botany, zoölogy and physiology, and geology and mineralogy. Whereas the last sciences to reach a genuinely inductive, or experimental stage have been the sciences of mind and society. In this transformation, the sciences of life, mind, and society have been markedly slower than the physical sciences, and the sciences of mind and society markedly slower than the sciences of life, and finally the sciences of society than the science of mind. The physical sciences and the biological and geological sciences had clearly reached an experimental and inductive stage by the eighteenth and nineteenth centuries respectively; whereas the remaining sciences have been slowly approaching this stage during the nineteenth century. Evidently this difference in the speed of transforming from rationalistic into inductive sciences has been due to the difference in complexity of the subject-

matter and to the difficulty of isolating the facts under study and of verifying the hypotheses entertained. Thus for centuries the following sciences or departments within science remained rationalistic:—the explanation of known geological facts; the theory of the origin of species of animals and plants and of the causes of their adaptation to environment; for the most part, the science of medicine; the theory of the origin and nature of the human mind and of its growth; theology and the science of the origin and nature of religious belief and custom; the theories of the origin and nature of society and of political institutions; the study of the origin and nature of economic customs and institutions; the science of the origin and nature of morals; the science of the origin and development of language; and in general the science of the origin and development of civilization.

The rationalistic theories entertained by seventeenth and eighteenth century thinkers in several of these fields are interesting and especially important to the student of the history of philosophy. But before considering them we shall do well to study briefly another aspect of this first modern philosophical movement, namely, its naturalism.

For further study read:

Höffding, History of Modern Philosophy, I, 176–178, 193–203, 218–222, 301–307, 356–362;
Windelband, History of Philosophy, 383–399;
Smith, N., Studies in the Cartesian Philosophy, 1902, 1–47, 137–146, 160–169;
Russell, B., A Critical Exposition of the Philosophy of Leibniz, 1900, 1–69;
Galileo (transl. Crew and Salvio), Dialogues Concerning Two New Sciences;
Descartes (transl. Haldane and Ross), Discourse on Method; Rules for the Direction of the Mind; Principles of Philosophy, Part I;

Bacon, Advancement of Learning; and Novum Organum, Book I.

2. Naturalism: The universe conceived as a perpetual motion machine.—The greatest philosophical revolution the intellectual world has ever witnessed resulted from the astronomical, dynamical, and physiological discoveries of the sixteenth and seventeenth centuries. The ancient Greek thinkers inherited from prehistory a conception of the world as a system contained within the sky. Figuratively speaking the Greek thinker was a chick within the egg-shell and he never really succeeded in pecking his way out. The modern thinker has done so. Now this egg was the geocentric system; that is to say, a world with the earth at its center surrounded by the heavenly spheres, a world, as conceived by the Aristotelian, finite in diameter with God immediately beyond, a world in which we ascend from earth to the higher and supernatural realms of the stars, and a world in which change and decay and all that we call natural ends this side of the moon. Though some Ionian philosophers and a few Pythagorean astronomers may have thought of the world in ways that contradicted all of this, they lacked the facts that could win the intellectual classes from the theories which agreed so well with prehistoric myths and with ordinary sense perception. In short, Greek thought failed to break through the egg-shell; and the shell remained unbroken until Copernicus and his successors made their way out and discovered a universe infinite in extent, a universe in which the earth occupies a position but infinitesimally important, and a universe in which matter and its mechanical changes of configuration are present everywhere. What had been before a world in which demons and the supernatural play an important part, now was seen to be a world dynamical throughout, to be one vast machine.

In less than two hundred years, from Galilei to Laplace, this revolution in thought was an accomplished fact.

With Laplace we get a complete naturalistic mechanical world conception. It was complete because by his time mathematics, mechanics and gravitational astronomy were sufficiently advanced to enable the thinker to give in their terms a rational account of the origin of solar systems and of the behavior of such systems when once in existence. Again, it was complete for by his time sufficient information was at hand to conceive and to justify the hypothesis that nature is a perpetual motion machine persisting in its world building and world destruction throughout infinite time. Finally, it was complete for all nature's processes could then be thought of as following by mathematical necessity out of preceding stages and in turn giving rise by the same necessity to succeeding stages.

But the name of Laplace marks only the end of two centuries of naturalistic development from Galilei. Already in the early part of the seventeenth century speculative thinkers foresaw in principle what Laplace and the intellectual men of his day had far more evidence for believing, that the world is one vast machine ruled by mathematical law. Such earlier thinkers before Laplace and before Newton, were Hobbes, Descartes, Spinoza and many of their contemporaries. From them and their successors the intellectual world had rapidly learned to adopt a naturalistic philosophy, so that by the end of the seventeenth century and the early eighteenth century naturalism had become as a matter of course the conception of the world entertained by the educated and thoughtful.[1]

[1] Some sixteenth century thinkers also, as I have already pointed out in the preceding chapter, were naturalists. The word naturalism is somewhat ambiguous, having both a generic and a specific meaning. Generically, it is the opposite of supernaturalism and is the

Let us now turn to the study of the influence of both rationalism and naturalism in certain fields of thought that are especially interesting as typical of the philosophy of the seventeenth and eighteenth centuries, such fields as religion, physiology, psychology, and social and political theory.

For further study read:

Höffding, History of Modern Philosophy, 212–235;
Paulsen, F. (transl. Thilly), Introduction to Philosophy, 1907, 53–74;
Ward, J., Naturalism and Agnosticism, Vol. I;
Windelband, History of Philosophy, 399–425.

For more extensive study read:

Lange, F. A. (transl. Thomas), History of Materialism, Vol. I, 215–330 and Vol. II, 1–123;
Smith, Studies in the Cartesian Philosophy.

3. Rationalism and naturalism in religion.—The influence of the rationalistic and mechanical conception of the world was quickly manifest in religious thought, and naturalism soon gave rise to new religious philosophies. In the first place, a machine-world cannot include the working of non-mechanical and supernatural agents, such as spirits or devils; for in a world ruled by mechanical law nothing other than events consistent with such law can be assumed to take place. All other happenings are but myth and superstition. In the second place, as a perpetual motion machine the world is not a stage on which divine plans and purposes are seen playing their part from day to

name of the doctrine that all of existence lends itself to scientific explanation. Specifically, it is the name of the doctrine that all of existence lends itself to mechanical explanation. In other words, naturalism in its specific, or narrow meaning is the belief that all science can be reduced to mechanics. It is in this latter sense, which of course includes the generic sense, that I have used the term in this section.

day or even from age to age. What happens, happens by inexorable law and by mathematical necessity. As it was absurd for men to think that the earth was the center of the universe with the entire drama of creation playing about the earth and directed toward the earth as the key to the plot, so it is absurd for man to regard his existence and his human interests as revealing the ends and plans of creation. Rather he must away altogether with every teleological theory of things and events and learn to see in every object the mere mathematical result of nature's mechanical processes. Ends or plans are not causes, for the only causes nature exhibits are the motions and configurations of material particles. If then the wonderful structure of animals and plants and the marvellous adaptation between them and their habitats seem the result of intelligent planning, he must rid himself of this illusion and gain a new way of viewing these things. Nature has produced these precisely by the same fundamental means by which she has produced all other things. They have come into being because material particles happened to have taken some extremely complex and unusual configuration. If you enquire why these particles happened to be in this configuration instead of in some other you merely force the naturalist to appeal to preceding stages in the configuration of the system under study. You raise the same sort of problem as though you asked why does the wind blow, and why north instead of south and why at forty miles an hour instead of at ten? The most science can do is to search for the preceding conditions of the atmosphere and of the factors varying the pressure of the air and thus arrive at the physical causes from which the fact to be explained follows by mathematical necessity. Thus if we knew enough, we could show that man and his history are but the mathematically necessary later configurations of part of the matter that once formed the solar nebula.

Besides leading to this antiteleological conception of nature, seventeenth and eighteenth century rationalism and naturalism led directly to three heretical hypotheses; and rationalism at least determined the typical forms taken by orthodox theology. Let us consider immediately the three heretical hypotheses. First, was pantheism. God is but another name for nature or the substance of nature. Second, was deism with its natural religion. The universe is a machine that like a clock the great clock-maker, God has constructed, wound up and set going; and of course it now appears merely as a clock performing its mechanical motions quite in accord with the laws of dynamics. Third, was of course an out and out atheism. God is a superfluous hypothesis.

Naturalistic pantheism had already made its appearance in the sixteenth century and most notably in the writings of Giordano Bruno; but its most famous teacher was the seventeenth century philosopher Benedict Spinoza. He defines God as the infinite and eternal substance from which the world follows as conclusions follow from their premises by logical necessity. Otherwise expressed, the substance of all things is God of whom they are but finite modes, and these modes are related to the substance by the same inexorable logical relation as are the many properties of a triangle to the triangle as defined by the geometrician.

Deism taught as its chief tenet the distinctly rationalistic doctrine that reason is the ultimate test of revelation. Christianity is essentially reasonable, therefore thoughtful men should subject it to rational standards of criticism, and should search both nature and the human mind for evidence of God's existence and of his ways and laws. Again Christianity is reasonable in that it is not mysterious and in that it is and has always been a universal religion, the religion of all men, everywhere and at all times. Evi-

dently then Christianity is merely, what man in those days called, a natural religion. So conceived it excludes much that the church has put into the confessions of faith and includes little besides the belief in God, immortality, and the future reward and punishment of man's deeds, which beliefs deists argued are innate and therefore universal and valid.

The deistic movement began in England late in the seventeenth century and early in the following century. From England it spread to France and to Germany, and remained prominent on the continent to the days following the fall of Napoleon's empire.[1]

Atheism, and especially an atheistic materialism, was a natural and logical conclusion for the follower of Descartes to draw. If nature about us, the body, and the nervous system within us are but machines and if the world mechanism can be thought of as eternal, God is a superfluous scientific hypothesis. Moreover, since these were the days when religion itself seemed but a matter of reason, a purely intellectual matter; it was logical to add that what is superfluous for science is superfluous also for the conduct of human life.[2]

These unorthodox theological doctrines were prominent in the late eighteenth century; and though they became decidedly less prominent in the nineteenth century, nonetheless they have persisted as a noticeable part of our present complex intellectual life.

Let us turn to the influence of rationalism upon orthodox religious thought. I have already pointed out that theo-

[1] Prominent among these rationalistic theists were Locke (*fl. c.* 1675); Toland (*fl. c.* 1710); Collins (*fl. c.* 1715); Tindal (*fl. c.* 1695); Voltaire (*fl. c.* 1735); Reimarus (*fl. c.* 1740); and many other writers in England, France and Germany.

[2] Among the prominent thinkers of this group were Holbach (*fl. c.* 1765) and probably most of his contemporary materialists in France, such as La Mettrie, Lamartine, Diderot and Helvétius.

logical thinking in the days of the reformation and the counter-reformation (that is the sixteenth and seventeenth centuries) remained essentially of the same type as medieval scholasticism, and as such was distinctly rationalistic. Some thinkers went back to St. Augustine as did Calvin and the French Jansenists, some kept to Aristotle and St. Thomas as did especially the Jesuits; but these theologians and most others were alike at least in presenting the doctrines of the church as matters to be proved or disproved, to be tested and verified, by the deductive reasonings of scholars and pedants in their libraries isolated from the world without and ignorant of the actual factors that control religious history and development.

The influence of the naturalistic movement could not change the essential character of this older theology. It could however influence it by lessening the respect for the older doctrines and for the religious life. This it did. At no other time has Christianity been so impoverished, so much a mere formality, as it was in the eighteenth and early nineteenth centuries. We may say, it has never been taken less seriously even by itself. Within and without the Church it was the "age of reason," the age of "free thinking."

For further study read:

McGiffert, A. C., Rise of Modern Religious Ideas, 1915;
Paulsen, Introduction to Philosophy, 145–192;
Windelband, History of Philosophy, 486–499.

For more extensive study read:

McGiffert, A. C., Protestant Thought before Kant, 1911;
Stephen, L., History of English Thought in the Eighteenth Century, 2d ed., 1881, Vol. I;
Locke, Reasonableness of Christianity;
Hume, Dialogues concerning Natural Religion; and Natural History of Religion;
Toland, Christianity not Mysterious;

Collins, Discourse on Freethinking;
Tindal, Christianity as Old as Creation.

4. Rationalism and naturalism in physiology.—Under the influence of the discoveries in anatomy in the late sixteenth century and in anatomy and physiology in the early seventeenth century the bodies of animals and plants came to be conceived as machines and to be explained by means of mechanics. From Hobbes, Harvey, and Descartes to the writers in the time of the French revolution man in particular was thought of as being a mere machine though of course a more complicated machine than the brutes and plants as they in turn are more complicated than inanimate machines. Thus, as animism was driven out of astronomy, so was it from biology also; and as the principles of mechanics were thought sufficient to explain the world of the stars, so were they thought sufficient to explain also the facts of life.[1]

But the living body not only seemed a mere machine, it also appeared easily explicable. Hence a purely deductive mechanics of life that would account fully for its origin, development and working seemed not only possible but already in part realized. Thus from the time of Descartes to the days of the nineteenth century men did not hesitate to speculate extensively regarding life and to deduce *a priori* on the basis of what seems to us extremely little

[1] The fact that should be here especially marked by the student of the history of philosophy is that the living organism seemed to men in the seventeenth and eighteenth centuries vastly simpler than it does to the biologist to-day. These times preceded microscopic anatomy and biochemistry and therefore a purely mechanical biology seemed within easy reach; whereas to us such a biology seems indefinitely remote. In short, the facts of life revealed to us during the past century by means of the microscope and by means of biochemistry have made the problems of life seem a thousandfold more complex than they seemed to Hobbes and Descartes.

information elaborate biological theories.[1] However, in saying this we must not forget that these days were also the ones in which biology was rapidly becoming an experimental and inductive science. In short, it was a time of transition in biology when rationalist and experimentalist and the man that in some matters is an experimentalist and in most others a rationalist lived and worked, studied and wrote in the same intellectual world.[2]

For further study read:

Huxley, T. H., On the Hypothesis that Animals are Automata.

5. Rationalism and naturalism in psychology.[3]— Philosophically more interesting than the rationalistic biology is the rationalistic psychology of the seventeenth and succeeding centuries. This psychology can be best illustrated and studied in the Cartesian school of thinkers, Descartes and his followers to the present day, and in the English school of associationists and their followers es-

[1] Even the nineteenth century has had her "deductive" biologists to whom life seemed simple enough to justify the attempt to derive the principles of biology from the ultimate principles of physical science. Best known among such attempts is that of Herbert Spencer in his Principles of Biology (1867).

[2] A great exception to the general rule presented in this section was the revival of animism by Stahl and the revival, in France in the late eighteenth century, of vitalism. From this revival came the widespread doctrine of a "vital force," obtaining until the middle of the nineteenth century and later.

[3] Among the prominent seventeenth and eighteenth century thinkers who influenced especially psychological theory the attention of the student of the history of philosophy should be called to the following: Hobbes (*fl.* 1630); Descartes (*fl.* 1635); Spinoza (*fl.* 1670); Locke (*fl.* 1670); Berkeley (*fl.* 1725); Hume (*fl.* 1750); Condillac (*fl.* 1755); Hartley (*fl.* 1745); Helvétius (*fl.* 1755); La Mettrie (*fl.* 1750); Kant (*fl.* 1765); Priestley (*fl.* 1775); Bentham (*fl.* 1790); Cabanis (*fl.* 1795); and James Mill (*fl.* 1815).

pecially in France. Descartes, following Greek and medieval tradition, regarded man's states of consciousness as phenomena of a substance radically distinct from matter, a spiritual substance, or soul; and for this reason and because of Descartes' great influence, the doctrine of two substances, matter and spirit, and the resulting belief in the irreducibility of the mental to the physical are appropriately called *Cartesian dualism.* This doctrine soon began to prove an extremely embarrassing theory for the Cartesian and many Cartesians therefore began to draw the conclusion which fitted better the general naturalistic philosophy, that is, materialism. Thus there have been in the seventeenth and succeeding centuries two closely related theories of the mental, Cartesian dualism and materialism. Let us study each briefly in outline.

By postulating two substances which cannot interact Cartesian dualism faced immediately the difficulty of explaining the seeming interaction of mind and body. If matter is susceptible of only mechanical processes, in other words, if all that happens in the physical world is but the displacement of particles of matter; then the only consequence of moving matter is further motion either in the same body or in some body with which it has collided, and, conversely, the only way in which one body can be made to move from rest is by the impact of some other moving body. But the most commonplace facts of daily life seem to show that body and non-body, that is, mind, interact. Motions in the body seem to produce mental states, and mental states seem to produce motions in the body. For example, a blow causes pain and fear causes flight. Here we have a typical rationalistic problem, a problem upon which more speculative ingenuity has been at work than perhaps upon any other problem; for the problem has remained prominent from the days of Descartes to our own time and promises to continue prominent as

long as Cartesian dualism persists. In all, three famous solutions have been proposed, each an admirable example of rationalism. The first solution denies any interaction between the two substances and postulates that God performs a miracle in each instance of seeming interaction, some million millions *per diem;* or it postulates that at creation the two substances were so harmonized that for all time they would behave as though they were interacting in spite of the fact that they were not. This latter doctrine is called the "pre-established harmony;" and is often illustrated by the figure of a perfect clockmaker who has made two clocks that keep always the same time and so appear to influence one another's behavior, whereas their harmony was pre-established at the beginning. Thus God at creation so arranged nature that when, for example, a bee stings a child and causes certain neural changes in the child's central nervous system, the spiritual substance will produce the pain in harmony with this physical fact and without any interaction between brain and soul! Evidently these first solutions could not long satisfy the scientific psychologist.

The second solution of which Spinoza may be called the originator is the doctrine called parallelism. This doctrine attempts to straddle the difficulty of Cartesian dualism by both holding to dualism and rejecting dualism. Though the parallelist admits a fundamental difference between the physical and the mental, he asserts that both are none the less the phenomena of only one substance. This substance is neither the matter nor the spirit of Cartesianism but a substance of which matter and spirit are two fundamental types of manifestation. Mind and body do not interact, for the physical manifestations of the ultimate substance have laws and relations which make the physical a closed system and in a similar way the mental forms a closed system. However, since both systems are but two

sides of the same thing or substance, every physical event is correlated with a unique mental event and every mental event with a unique physical event thus giving quite the semblance of interaction. That is to say, moving matter does not produce mental states and mental states do not produce motions in matter; but both, being present and correlated with some unknown state of the ultimate substance of which they are phenomena, have uniform laws of sequence and coexistence. Again, inasmuch as the two are phenomena of the same substance, there is for every mental event a corresponding physical event and for every physical event a corresponding mental event. In short, the parallelist is forced by his logic to proceed from explaining known instances of mental life to assuming that mental events are as universal as are physical events, a doctrine called panpsychism.[1]

A third possible solution of the difficulty raised by Cartesian dualism is to retain interaction as a fact and to try by ingenuity to make it consistent with mechanics. This doctrine is frankly a return to animism.

But the Cartesan could avoid all of these difficulties by giving up his dualism and frankly accepting materialism; and as the decades passed many thinkers preferred this solution. These materialists were especially prominent in France from the middle of the eighteenth century on into the nineteenth century, and materialism seems to be not infrequent among the intellectual classes at the present time. According to the materialist the mental is not the manifestation of some second substance but is as physical as is any other process of the living organism. It is merely an obscure name of brain motions or of chemical-physical processes.

Thus far we have taken Cartesian dualism and one of

[1] Parallelism is widely held by psychologists to-day and this implies that most psychologists are still Cartesian dualists.

its metaphysical problems (of a distinctly rationalistic type) to illustrate rationalism and naturalism in seventeenth and eighteenth century psychology. Let us take a second important illustration of rationalistic psychology, the associationist psychology. The seventeenth century father of associationism was Hobbes. But more influential than Hobbes were Locke, Hartley, Hume, and their successors, especially in England and France. The associationist endeavored to discover a mechanics of mind corresponding to the mechanics of physical science and to do so needed to discover a universal principle by means of which man's mental life could be completely explained. This principle was found in sensationalism and the accompanying law of association. Figuratively speaking, the mind starts an empty tablet on which are written from childhood to old age the sensations of color, sound, touch, taste, odor and the rest, man's organs of sense and nervous system being the instruments of writing. Then by a process of connecting these sense data, called the association of ideas, the complex adult mind, including the memory, thought, personality, character and sentiments of the mature man is formed. In the first place, this sensationalism and associationism makes man's mind the creature of his environment; for it makes his character, knowledge, science and logic a matter of sensations and their combination. In the second place, associationism makes the individual mental differences between men also a matter solely of education. Thus it forms precisely the needed foundation for the democratic doctrine that men are born equal and that education alone is needed to perfect human life and to bring into being the ideal democratic society.

For further study read:

Paulsen, Introduction to Philosophy, 74–111;
McDougall, W., Body and Mind, 1911, 46–148;
Dessoir, Outlines of the History of Psychology, chapter III;

Warren, H. C., Mental Association from Plato to Hume, Psycholog. Review 1916, *23*.

For more extensive study read:

Klemm, History of Psychology;
Warren, H. C., History of Association Psychology (forthcoming).

6. Rationalism and naturalism in social and moral science.[1]—If ignoring the details of the complex development of modern moral, social, political, and economic science we regard only the general characteristics of this development, we behold the same general course from the rationalistic stage to the experimental, or inductive stage. However, one important difference between the development of the physical sciences and that of the moral and social sciences appears; for the former became rapidly experimental, whereas the latter have but slowly ceased to be rationalistic, or deductive. Indeed, only in recent decades have students of morals and of society deliberately striven to set their prejudices and assumptions aside, to let the facts tell their own unbiased story and to seek to verify theory by a genuine appeal to fact. Hence though moral and social science was a prominent part of modern European thought as early as the sixteenth century and continued to be so to our own time; the history of these sciences is largely a succession of rival theories based upon quite inadequate information and strongly influenced by the prevailing moral and social struggles and movements within the age or the nation of the thinker.

As might be expected rationalistic thinkers grossly

[1] Among the numerous political theorists of the sixteenth, seventeenth and eighteenth centuries the attention of the student of the history of philosophy should be called to the following: Machiavelli (*fl.* 1510); Bodin (*fl.* 1570); Althusius (*fl.* 1600); Grotius (*fl.* 1625); Milton (*fl.* 1650); Hobbes (*fl.* 1630); Spinoza (*fl.* 1670); Locke (*fl.* 1670); Montesquieu (*fl.* 1725); Rousseau (*fl.* 1750); Adam Smith (*fl.* 1765); and Bentham (*fl.* 1790).

underestimated the complexity of man's moral and social life; and as a consequence the problem conceived as simple was given a simple and, as it seemed to the theorist, a self-evident solution. These solutions were based upon equally *a priori* theories of the nature of man. In general, man seemed a presocial individual by nature; that is to say, man seemed older than society and seemed to be by nature an individualist that had to be socialized to make even rudimentary society possible. Put in still other words, man seemed more like the lonely carnivora than like the herd animal which he is now known to be. Again, man was conceived to be by nature either a struggler to preserve self or a seeker after pleasure; and therefore social theory tended to find in the one or the other of the corresponding instincts the controlling factor in the origin and development of society. To-day we know man to have neither instinct, but rather to have many inborn traits that lead him to seek food, to fight or avoid certain dangers, to compete for social approval and to be satisfied or annoyed in certain situations. Again, the rationalistic thinker tended to regard man as decidedly more rational than man is and thus to underestimate grossly the part played by instinct and blind behavior in developing morals and society. One famous illustration of this tendency was the contract theory of the origin of society. By this theory society was thought to have arisen in somewhat the same way as that in which two men may form a partnership and sign the requisite agreement. The origin of society was an essentially rational contract whose terms could be identified by the theorist. Hence a deduction from these assumed terms enabled the theorist to criticise the moral and political movements of his day and to show wherein they agreed or disagreed with the terms of the contract upon which society as such rested either in fact or in principle.

For further study read:

Paulsen, F., System of Ethics, 126–215;

Stephen, L., History of English Thought in the Eighteenth Century, Vol. II.

For more extensive study read:

Dunning, W. A., History of Political Theories, from Luther to Montesquieu;

Davidson, W. L., Political Thought in England from Bentham to J. S. Mill (Home University Library);

Sidgwick, H., Development of European Polity, 316–377.

7. The development of toleration.—The seventeenth century, the century of rationalism, was both a time of religious intolerance and a time in which the spirit of toleration had its birth. State and Church for centuries past, yes, for all time past, had been united; and men had not come truly to dissociate the two. For the savage and the barbarian, religion is distinctly a group, or tribal matter, and genuinely personal religion is only incidental to folk religion and worship. Hence Church and State issued from the middle ages in closest alliance, and hence the religious revolution of the sixteenth and seventeenth centuries was a serious political as well as religious metamorphosis. The general attitude of the people of the seventeenth century was that the State had both the right and the duty to insist upon a state religion and upon the conformity of all citizens to the doctrine, discipline and worship of the state church. In contrast with the attitude taken by society, a new attitude of religious tolerance was taken by a few thinkers in this enlightened age; and because of the new spirit of enlightenment and because of the economic and political transformation Europe was undergoing, these leaders won their cause during the eighteenth and nineteenth centuries.

For further study read:

Bury, History of Freedom of Thought (Home University Library);

Lecky, Rise and Influence of Rationalism, chapter IV.

For more extensive study read:

Schaff, P., Progress of Religious Freedom as Shown in the History of Toleration Acts, 1889;

Milton, Areopagitica (ed. by Hales);

Locke, Letters concerning Toleration.

8. The idea of progress.—Perhaps the greatest intellectual achievement resulting from the complex intellectual forces which we have been studying was the rise of the idea of progress. In ancient days nations progressed but they did so unreflectively, they did so without making progress itself an enterprise. The Christian Church of the ancient and medieval world had her mission directed toward another world and cared nothing about progress in this world nor taught her children to care. But in the seventeenth century men discovered the ideal of progress. The thought dawned in their minds that far greater achievements were open to mankind than those yet attained in science, morals, government and society. They felt themselves at the beginning of a great age, an age in which research and reason would discover ways and means to make the life of man far better and far nobler than it had ever been. Above all, they felt that science was to be the chief instrument. As we look back upon their dreams and hopes, we see that the task was far more difficult and the problem far more complex than they knew or could know it to be. Yet, utopian as were their thoughts, the results have really been far more than they ever dreamed. The sciences they began have revolutionized the world, the struggles for tolerance, democracy and freedom which they commenced have brought a humanitarianism and an ideal of social progress and effi-

ciency they little foresaw. And the idea of progress has become not merely the dream of a few thinkers but the conscious enterprise of the nations.

For further study read:

Brailsford, H. N., Shelley, Godwin, and their Circle (Home University Library);

Flint, History of the Philosophy of History, 87–104.

For more extensive study read:

Bacon, Advancement of Learning;

Herder, Ideen zur Geschichte der Menschheit;

Condorcet, Tableau historique des progrès de l'esprit humain;

Delvaille, J., Essai sur l'historique de l'idée de Progrès jusqu' à la fin du XVIIIième Siècle, 1910.

9. The effect of naturalism upon the general intellectual life of the modern world.—In conclusion, let us ask what has been the effect of the rationalistic and naturalistic movement upon the general intellectual life of the modern world? The answer can be given in one word, *enlightenment.* Enlightenment has denoted many traits of which five are most prominent. First, it has denoted the eliminating of superstition and the acquiring of a distinctly naturalistic, or scientific attitude toward a vast number of the events and objects that form our environment. The processes of nature from the phenomena of the distant heavens and from the phenomena of the weather to the causes and cure of disease and to the growth and education of the child's intellect and character have come to seem to the intelligent man a proper object of research and of scientific explanation. Even though prescience obtains in limited fields, this change from medieval prescientific and barbaric belief and custom has been a vast transformation. Second, enlightenment has denoted the freeing of personal religion from that of the group, at

least to a large extent, and the freeing of thought. No doubt much religious intolerance still obtains in fact; but among the most cultured peoples complete legal and political freedom have been secured for religious nonconformists, and Church and State have tended to become dissociated. Third, enlightenment has denoted the spread of humanitarianism. This has been especially evident in the change in customs of treating the poor, the debtor, the insane, the delinquent and the criminal. True, much that is barbarous still remains; but the change in these customs during the past three centuries has been vast. Again, humanitarianism has been evident in the growing abhorrence of war and its cruelties. Finally, humanitarianism has been evident in the general effort to ameliorate the lot of the wage earner and the peasant, and to educate the masses. Fourth, the enlightenment has increased utilitarianism. This has been manifest not only in the vast industrial, commercial and engineering enterprises of the modern world but in the multitudinous lesser enterprises from the exterminating of mosquitoes to the exterminating of disease and from the growth of social efficiency to the rise of utilitarian curricula and rational methods of instruction in schools and higher institutions of learning. Fifth and finally, the enlightenment has denoted the spread of democracy and democratic laws and institutions. It has given us the gospel of liberty, equality, and fraternity, and of economic freedom.

For further study read:

Brailsford, H. N., Shelley, Godwin, and their Circle;

Morley, J., essays on Voltaire, Diderot, Rousseau, and Condorcet.

For more extensive study read:

Stephen, L., History of English Thought in the Eighteenth Century;

Lecky, Rise and Influence of Rationalism;
MacDonald, F., Studies in the France of Voltaire and Rousseau, 1895;
Lévy-Bruhl, History of Modern Philosophy in France;
Cambridge Modern History, Vol. VIII, chapters I and XXV.

CHAPTER XXIV

PHENOMENALISM, POSITIVISM, AND IDEALISM

1. Introductory.—A second philosophical movement of great importance became prominent in the eighteenth century having its source in the earlier rationalistic and naturalistic movement. This second movement included at least three important tendencies which are named respectively phenomenalism, empiricism and its resulting positivism, and idealism. All three were closely related. Indeed, the two latter tendencies developed directly out of the first, that is out of phenomenalism.

2. The terms, Phenomenalism and Empiricism defined.—By phenomenalism is meant the doctrine that the immediate object of all our knowledge is mental, a doctrine which follows logically from the conception of the mental held by the intellectual world from the time of the Greek thinkers. Prescientific man with his animistic hypothesis leaves the nature of perception and knowing a negligible and comfortable mystery; but as science arose, thoughtful men distinguished between "the appearance of things" and "the things themselves" or between the objects of sense and the entities of science.[1] This distinction between the world of sense and the world of science led men to attend to what we call our mental states and to ask: What are these mental states and how are they related to

[1] In modern phrase, as I look at a piece of wood I do not see the atoms of the chemist, or as I hear a sound I do not behold the air waves of which the physicist speaks, or again, as I see the room it has acute and obtuse angles in its corners whereas the architect's plans imply that all these angles are right angles.

the entities of science? In answering this question, no doubt men continued to be much influenced by animism; for animism led men to think of their mental states as states not of things without the body but as states of an entity within the body, the soul, and it led men to think that the mental state and the external object may be neither similar nor numerically identical. Thus a dualism arose between the world within the mind, the mental states, and the world without, the entities of science. What the mind experiences is only mental, its own states, its feelings, its sensations, and its thoughts; whereas the world of things without remains without, never entering the soul. The break between the two worlds is complete and a skepticism arises which questions whether or not we can know aught but our own mental life. In short, the only world we experience is a subjective world, a world of mind and not a world of things; and we have no guarantee that the two worlds in any way resemble one another.

By empiricism is meant the denial of rationalism's claim that man has in his mind the *a priori* principles by which science can get, through reflection or intuition, its fundamental and eternal groundwork. Empiricism asserts that man comes into this world innocent of knowledge, and that all the knowledge he ever gains, is what experience brings him. In other words, what experience teaches, man can learn; but what experience does not teach, man can never know. This conclusion at once leads on to the important question: Does not science, and especially rationalistic science, pretend to know more than experience actually teaches? Or reworded, Should not science be cautious to formulate her doctrines so that she never even seems to assert more than man can literally experience? The affirmative answer to this question is called positivism. But this answer leads in turn to a second question: If science may not go beyond experience,

can she explain what we do experience? The positivist replies: No. *Science can describe but science cannot explain that which is experienced.* In short, science is merely the systematic description of man's experience; and therefore science when it pretends to be an explanation of what man experiences, becomes an invalid rationalism.

Let me expound this important doctrine of positivism at greater length. As phenomenalism maintains, man experiences only his own mental states and their order; therefore, the positivist points out, man does not experience the logical or causal connections between things in nature or between nature and experience. That is to say, nature does not reveal such connections in man's sensory experience; and therefore when he tries to ascertain her laws he is obliged to go beyond the evidence the senses furnish. All that man experiences is the mere succession of events. He sees ice melt in the sunshine, but he does not see *why* ice melts. He sees the pendulum swing back and forth in equal intervals, but does not see *why* it so swings. He sees that his arm moves when he so wills, but he does not see *why*. Moreover, he cannot appeal to innate ideas to help him to explain his experiences; for there are no innate ideas such as the rationalist claims to possess and there are no ideas in man's mind corresponding to the abstract entities of the mathematical and physical sciences. For example, man has no innate insight into the fundamental principles of mechanics. In fact, he often believes what physical science denies, the spontaneous origin and cessation of motion, the freedom of the will and similar animistic hypotheses. Again, man cannot picture empty space, infinity, matter (that is, with all qualities abstracted), causal necessity or substance. These are mere words or symbols and not genuine ideas. Finally, it is not essential that man should have the information rationalism pretends to furnish. All man needs to know in order to pros-

per is precisely what experience is capable of giving, the succession of events. Thus to avoid the fire man needs to experience what happens when he touches fire; but he does not need to know the *ultimate* rationalistic explanation of why fire burns.[1]

These two doctrines, phenomenalism and positivism, sound astonishingly unlike rationalism; but as a matter of fact they grew directly out of the tenets of the rationalistic movement and belong to that movement. Descartes' dualism between mind and body, the so-called "Cartesian dualism" was a sufficient starting point; for it forced the philosopher to enquire into the nature and possibility of science.[2]

3. Phenomenalism and Idealism.—The result of this

[1] In the phrases of recent thought, man, like any other organism, has the traits that enable him to survive and to reproduce his kind; and this is all that nature requires of him. From the standpoint of nature it is no more necessary for him to know the real world or to explain that world than it is necessary for the oak to know meteorology or the chemistry of the soil. What is necessary is that the oak have the responses that will make it thrive. As long as this condition is fulfilled what matters it that the oak is ignorant? The same is true of man. He has the system of responses called knowledge; and all that is required of his knowledge is to lead him to the right responses. Insanity would be precisely as valuable biologically as sanity, or delusion as correct insight, provided the resulting responses adjusted man to environment, a fact to which the oak bears witness, for in its complete ignorance the oak adjusts itself to the conditions of life with a skill far beyond the wisdom of the most learned scientist to adjust it. To sum up, according to positivism man can but watch his sensations, mark their order and secure accurate descriptions of the world called *our experience*. And the thing he cannot do, is to explain the things themselves that lie beyond this experience and that do not reveal to him what they are or why they are.

[2] Among the most prominent Cartesian students of human knowledge in the seventeenth and eighteenth centuries are: Descartes (*fl.* 1635); Malebranche (*fl.* 1680); Spinoza (*fl.* 1670); Locke (*fl.* 1670); Leibniz (*fl.* 1685); Berkeley (*fl.* 1725); Hume (*fl.* 1750); Kant (*fl.* 1765).

enquiry, beginning with Descartes and lasting to living Cartesian dualists, has been a revival of ancient phenomenalism, of a phenomenalism similar to that of Democritus. It has been aptly nicknamed from an illustration of its doctrine, "the metaphysics of the telephone exchange." The phenomenalist, or subjectivist seems to assert that each mind is like an imaginary telephone operator born a lonely Robinson Crusoe not on an island but in a telephone exchange. Here this person has throughout life been receiving the messages from a world that he has never seen and by hypothesis never can see, or experience in any way other than through his telephone instruments. From these messages he may infer that there are other Robinson Crusoes and that there is a vast physical but unperceived world in which he himself lives. At least, it is within the conditions of the illustration that he may infer such an external world. But two other possible inferences remain also within these conditions. He may infer that only these Robinson Crusoes, including himself, exist; or he may infer that the world that he directly perceives, namely, his exchange and its instruments, are the entire universe and that the messages he seems to be receiving are the direct product of the receiving instruments themselves.

That is to say, the Cartesian dualist makes every mental state purely subjective, he makes every mental state the possession only of the mind whose state it is; and therefore he seems to assert for each mind a condition of affairs quite comparable to the lot of the aforementioned Robinson Crusoe. *Each man perceives or is aware of his own mental states and of nothing else in the whole universe.* He is aware of nothing else; for by definition whatever he is aware of, is a mental state, and by theory, or assumption, mental states have no existence other than in the mind whose states they are. If this then be the lot of each mind,

the philosopher may make any of the following inferences: (1) He may infer with the ignorant and thoughtless that our mental states, or let us say the world of our experience, duplicates an objective world that in the main would be what it is whether or not we had been born. In short, he may infer that to all intents and purposes we do perceive the objective world. (2) With Democritus, Descartes and Locke he may infer that there is an objective world and that by thought or experiment the scientist can learn its nature, though admitting that man can never perceive or directly experience this world. Thus he decides that the objective world is an inferred world, a world of science quite unlike the world of perception, or in Greek, a noumenal world; whereas the experienced world is phenomenal. As a rule this objective world is thought of as the world of matter and energy as conceived by physical science. (3) He may infer that there is no such non-mental world. What the mind directly perceives is by definition mental, and therefore we are assured of the existence only of the mental. Indeed, the physical is a superfluous hypothesis. This doctrine is usually called *idealism*. When the question is carried still farther and one asks regarding the relation of the universe to this mental world which we directly experience, at least three possible answers may be given. (a) The philosopher may say: "I alone exist, for only my mental states are perceived by me and I can account for the universe of my experience as literally *only my experience*." This doctrine is called solipsism. (b) He may say: "Only minds exist, and the world that I experience is but a society of minds whose interaction with one another gives me the world of my experience. This world is indeed a different world as we examine it comparing one man's experience with another's; but none the less it is never the lonely creation of one mind but is the creation of a group of minds." (c) He may say: "My mind is

part of a larger mind, a universal mind; and my experience and the world revealed in my experience can be explained as part of the larger experience of that mind. That is to say, there is a world beyond my individual experience but not the physical world of the dualist which by definition transcends all possible experience, but simply the world of a larger experience into which my experience would itself grow could it keep on forever in the growth begun in childhood and lasting to my present state of partly organized experience. In still other words, the universe is my experience grown until it has reached the stage or limit called a universal and perfect experience. My present experience is of course imperfect, incomplete, and partial. Hence I can contrast with my experience another experience, an ideal one, one implicit in my imperfect experience, the universal, or absolute experience."

The statements made thus far in this section would probably seem startling or absurd to the intelligent but hard-headed man of affairs. He might say, if that is the result of philosophical thought the less we have of it the better; but in so saying he would do a gross injustice to the facts of life and to the part this problem has played in the drama of European thought. Even the most hard-headed man has to admit the following:—It is a fact that each man in some sense or other lives in his own private world. Again, it is a fact that in some sense or other the world of each man's experience has been socially formed, is, in other words, the resultant of the interplay of minds. Again, it is a fact that in some sense or other the world has kept growing in the mind of the human race, that we look forward to further growth toward some, perhaps unimaginable, limit; and that we may in some sense or other speak properly of our experience being part of a larger or universal experience. Finally, it is a fact that the world we talk about most frequently in science is in some sense

or other not the world of man's perception. Now as students of the history of philosophical thought it is not our business to ascertain in what sense these matters are facts; but it is our business to note in what sense the intellectual classes of Europe have tended to believe them to be facts and to note the rôle the resulting philosophical dogma has played in the drama of the past three centuries of European thought. Let us then turn directly to these matters.

4. Phenomenalism in modern thought.—Common sense has remained little concerned with this problem of phenomenalism, or subjectivism; but most men have remained thus unconcerned chiefly because, through long racial training, they have socially inherited workable solutions of the most frequent and pressing problems raised by subjectivism. In short, we manage the ordinary affairs of daily life so skillfully and unreflectively that we are able to ignore the difference between what we call "things" or "realities" and "their appearance."

The steps beyond commonsense were taken, at least most prominently, by Descartes and later by John Locke. These steps, as we have seen, proceeded from Cartesian dualism as an absolute or fixed stepping stone whose immobility and security were never questioned. These few steps brought Descartes and Locke to the position virtually of Democritus, to a phenomenalism which leaves the true nature of the non-mental world to be ascertained by scientific research. I believe it can be said without question *that this has remained to the present day the accepted philosophical position of the vast majority of scientific men.*

However, it has been easy to take one step more and to reach an agnostic phenomenalism, or positivism. As we have seen, according to positivism the only world man can know is the world of his experience, and the task

of science is not to reveal a world beyond perception but merely to invent a system by means of which to organize or to describe the world of experience.[1] This extreme phenomenalism, agnosticism, or positivism commenced to appear prominently in European thought in the writings of David Hume and of Immanuel Kant, that is, in the middle and latter half of the eighteenth century. In the nineteenth century it has been especially prominent in Germany, France, and England and is held to-day by some of the ablest scientists.

The next step in the development of subjectivism proceeds beyond phenomenalism to idealism. Idealism asserts that if the world of experience is mental then all is mental, for "to be beyond the world of experience" is meaningless being equivalent to "the unthinkable." Reality is experience, is mental. This famous step in human thought was taken by Berkeley and although taken by others in his time will perhaps always be associated with his name.[2]

[1] This organization may be the work of inborn organizing faculties in man's intellect, giving man *a priori* or necessary principles of science (a doctrine called transcendentalism); or this organization may be based upon the general biological tendencies that lead man to adjust himself to environment. In this latter case the principle at work is biological utility, or convenience. The famous author of transcendentalism was Immanuel Kant. The most noted upholders of the latter doctrine have been the contemporary thinkers, Ernst Mach, Karl Pearson and Henri Poincaré.

[2] Idealism has been prominent in nineteenth century thought though by no means as prominent as phenomenalism. However, it has been decidedly influential among philosophers in the narrow sense. Of the idealists two important schools deserve to be remembered by every student of the history of philosophy: first, the Berkeleian school, especially in England; second, the German idealists and their followers, especially in England and America. The influence of idealism upon the general intellectual life of Europe since the eighteenth century has been decidedly one-sided. It has been marked in the fields of political and social science, in ethics and reli-

5. The subjectivistic problem of knowledge.—One of the most remarkable influences of subjectivism is, as we have seen, the belief in the importance of the problem of the nature, validity and limits of human knowledge. Even Descartes was troubled with the problem, whether or not science is possible. As a rationalist his bias in favor of science saved him from skepticism, but the modern reader can hardly fail to feel that the doctrine of innate ideas is a treacherous life raft by which to rescue science from the waves of skepticism. Locke, in his immortal book, bore witness to how urgent the problem of knowledge could become to a good Cartesian of the second generation. The chasm left by Cartesian dualism between the knowing mind and its object was clearly perceived and Locke was perplexed as to how to build a trustworthy bridge to span the chasm. If the only objects of direct knowledge are mental states, by what indirect means can man know the non-mental object? Kant, another Cartesian, reached the conclusion of the matter, the world of things in themselves, the world that Descartes and physical scientists had regarded as the true object of their research, is quite unknowable.

But the important fact is that all Cartesians were forced to make the solution of the problem of knowledge the major part of their philosophical thought, that they were forced to make this problem prior to all other scientific research, and that they were forced to drift farther and farther away from commonsense and actual scientific methods and traditions in reaching the remarkable and perplexing solutions which one after another were offered to the world by such great Cartesian thinkers as Locke, Berkeley, Hume, and Kant. From Locke to the present time the

gion and in the romantic movement; whereas its influence upon mathematical, physical and biological science has been quite negligible.

theory of knowledge has stood in the forefront of European philosophical thought and has tended to divorce the philosophical thinker from those men of scientific research who have gone calmly on their way little troubled by the difficulties and perplexities of the students of knowledge and proving by their remarkable success that science can flourish though her nature and her very right to exist are causing some men profound anxiety and perplexity.

For further study read:

Pearson, K., Grammar of Science, 3d ed., 1911, espec. chapters II and III;
Berkeley, Dialogues between Hylas and Philonous;
Windelband, History of Philosophy, 466–486;
Watson, J., Selections from Kant, 1–222;
Russell, B., Problems of Philosophy (Home University Library).

For more extensive study read:

Smith, Studies in the Cartesian Philosophy;
Paulsen, F. (Creighton and Lefevre transl.) Im. Kant, His Life and Doctrine, 1910;
Locke, Essay Concerning Human Understanding (Calkins' selections from);
Berkeley, Principles of Human Knowledge.

6. Empiricism and positivism.—With Locke and his successors began the important philosophical movement, empiricism. As we have seen, it was governed by a careful study of the actual content of man's mental states. Such an examination led Locke to dispute correctly the presence of innate ideas and to express some perplexity regarding several of the terms of science, such as substance, energy, infinite space and others. In his successor Berkeley the revolt against rationalism became open and extreme. Berkeley could not find among man's mental states any abstract ideas and from this absence of abstract ideas he inferred that those terms of science which presuppose such

ideas, are meaningless words. Matter robbed of all empirical content, such as color, is an abstract and impossible idea and the matter of mechanics is so robbed. Empty space and time and infinity are similar abstract terms and are also mere words. Therefore abstract mechanics is mere words. Finally, the best known and most thoroughgoing positivism, for such this extreme empiricism had already become, was that of the great English thinker David Hume. He agreed quite with Berkeley regarding the impossibility of abstract mental states; and he submitted some of the fondest notions of rationalism to a fatal criticism. These notions were especially those of substance and causation. Search the mental states of man and nowhere do we find any idea of substance or necessary causal connection, or efficacy. An orange we can perceive, but rob the orange of all its qualities and the remaining substance in which these qualities are said to inhere has become, as far as man's ideas are concerned, a mere zero. Thus when man uses the word, *substance*, he means no more than the empirical fact that the qualities cohere in the visible, tactual and otherwise sensible object. In short, the term substance has no rightful place in science and the same may be said of cause. We perceive that one event follows another or coexists with another, but we never perceive that it has to do so or why it does so. No scrutiny of what we actually perceive reveals any other connection between events than the empirical fact of temporal and spatial contiguity and of similarity and difference. From no event can we deduce its consequent. Apart from experience the most careful examination of a piece of bread would not tell whether or not it will nourish or for that matter whether or not it will blow the universe to star dust. The wisest man that ever lived could deduce nothing merely from bread other than the content as perceived. In short, force, energy, causal necessity and all

rationalistic explanation of what has to be and of why things are as they are and do as they do, are mere pseudo-science and should be abandoned. All that man can do according to Hume's positivism is to describe actual experience and live as experience teaches. Man can explain nothing.

For further study read:

Berkeley, Principles of Human Knowledge, Introduction and sections 85–134;

Hume, Enquiry Concerning Human Understanding.

For more extensive study read:

Mill, J. S., Comte and His Positivism;

Pearson, K., Grammar of Science;

Stallo, J. B., Concepts and Theories of Modern Physics, 1881;

Nunn, T. P., Aims and Achievements of Scientific Method;

Höffding, History of Modern Philosophy, 293–433.

7. Objective idealism.—With the successors of Kant, the nineteenth century idealists, the problem of knowledge was solved in a radically different way. Idealism, rejecting any other than the world of experience, faced quite a different problem from that faced by Locke and Hume. The question was no longer, how can we transcend experience and know an extra-mental world? Nor was it longer, how are substances and forces to be revealed to minds that sense only qualities? Rather it was the problem of the mind's own inherent ways of organizing man's sensory experiences into the complex world that increasing maturity in knowledge brings into existence as a matter of fact. For example, the experiences of the child are not integrated to any great extent and the child can hardly be said to have a world at all. As the child grows in experience it grows also in mental organization and thus a genuine cosmos arises as the object of its knowledge. With further maturity and especially with

the maturity which we call man's progress in science, generation after generation, the world of experience becomes richer and richer in content and more and more organized into a coherent system. Now what the word, *reality* means, is not some external object but the ideal goal of this evolution of human experience, not some world apart from the mind but the developing mind itself reaching the limit of its growth in the ideal history of the human spirit.

If we adopt this point of view phenomenalism itself has been escaped and the problems raised by Hume are easily solved. This idealism is genuinely objective, because there are no objects except those of experience and because the experience of which we are speaking is not merely the experience of the individual man or even the experience of the human race but universal experience of which the experience of the individual and the race are but important historical and finite stages. Thus the experience of which the objective idealist speaks is beyond history and man, and is superpersonal. As such it escapes with difficulty from being a merely mystical entity, from being a symbolic formula such as the limit of a mathematical series, or from existing merely in the sense mathematical entities can rightly be said to exist. However, this limit of evolving experiences is reality, the absolute, or the absolute mind of the objective idealist. As a theory of knowledge it solves all the older problems by making everything immanent in the growing mind and reducing the problem of knowledge to that of discovering the inherent (or, what certainly looks like, the inborn or instinctive) embryonic course of intellectual development from the child to the ideal limit of intellectual growth. In short, objective idealism reduced the Cartesian problem of knowledge to a problem of mental growth.

Objective idealism had its beginnings in the *Critique*

of Pure Reason [1] of Kant and reached virtually its final exposition in the *Logic* and other writings of Hegel (*fl.*1810). Since Hegel's time it has become an important movement in Great Britain and America. Here again, the historian cannot fail to mark the complete divorce between science and this lonely and largely academic doctrine. Perhaps the future may bring them together but at present this movement, large and important as it no doubt is, seems an eddy rather than the main current of European philosophical thought. True a possible exception must be made in this statement because of the influence of Hegel and his school upon historical study in the nineteenth century; but this influence seems to have been outgrown and this much to the relief of historical science. In contrast with positivism idealism seems to have been less able to win the intellectual classes and to have played small part in furthering man's scientific enterprise. Rather, it has had its influence through the romantic movement of which it was a part and to this we shall return in a later chapter.

For further study read:

Windelband, History of Philosophy, 529–622;
Paulsen, Im. Kant, His Life and Doctrine;
Caird, E., The Critical Philosophy of Kant, espec. chapter I;
Höffding, History of Modern Philosophy, Vol. II, 29–109;
Royce, J., Spirit of Modern Philosophy, 101–471;
Watson, Selections from Kant;
Fichte, Vocation of Man;
Calkins, M. W., Persistent Problems of Philosophy.

For more extensive study read:

Haldane, R. B., Pathway to Reality, 1906;
Münsterberg, H., The Eternal Values, 1909;
Taylor, A. E., Elements of Metaphysics, 1–119;
Caird, J., Introduction to the Philosophy of Religion.

[1] Published in 1781.

8. The influence of phenomenalism and positivism upon the intellectual life of the past two centuries.— Agnostic phenomenalism and positivism have favored both the conservative and the radical religious thinkers. On the one hand, it has been argued that if man is limited in his knowledge to what he experiences, a knowledge of God and of a supersensible world-order is impossible, is indeed an idle speculation. On the other hand, it has been argued that the older rationalism and its atheism have become bankrupt and that now there is room in the universe for God, the divine order and revelation. If the real, or supersensible world transcends science, science certainly can not contradict the hypotheses of religion regarding this supersensible world. After all, this world may be what religion claims it to be, and as science has admitted her inability to decide, man's heart and conscience are left free to judge. In other words, if man's heart and conscience demand such a world and if science must remain neutral, the victory is won and man can again believe in God, freedom, and immortality, or in divine revelation. True, he cannot give a rationalistic proof of this belief but he can accept the verdict of his heart and conscience as final practical postulates. In this way the downfall of rationalism led to man's heart and conscience arising supreme in the directing of life and faith.[1]

In the realm of science the field especially and immediately influenced by phenomenalism and positivism was that of psychology and social and moral science. Phenomenalism and positivism were powerful factors in the

[1] This position is evidently on the verge of romanticism. Its two most prominent representatives in the eighteenth century were Berkeley and Kant. Of its many prominent advocates in the nineteenth century Ritschl in Germany and Mansel in England have been especially influential among theologians.

tendencies I have described in the preceding chapter, namely, sensationism and associationism. If mental life is ultimate, the science of mental life can hardly go beyond mental analysis and description. Physiological research and explanation can hardly contribute to a science that stands logically prior to all other sciences and whose very problems are the origin and nature of man's world and all its contents. Thus psychology drifted into the dreary and elaborate introspective study of mental states and their analysis and integration, and remained such a study until the doctrine of evolution began to transform psychology again into a biological science.[1]

In conclusion, whatever may have been the specific forms taken by subjectivism, subjectivism in general has tended during the past two hundred years to weaken confidence in the reality of the world, in the enterprises of man's life and in the principles of morality and religion. The world has come to seem to many man-made, or mind-made rather than real. Certainly in its extreme forms subjectivism has weakened the sense of the reality of things to a degree that substitutes hypnotism for science or skill. *It has emphasized belief rather than reality* so that some men have come to care more about being confident than about being right. Again, it has weakened the sense of duty and the authority of the law, by regarding man's mind as the maker and remaker of both. The ultimate criterion of reality and of the true, the good, and the beautiful have become for many thoughtful men merely human satisfaction. Among the highly intellectual classes subjectivism has certainly tended to make men approach the solution of problem after problem from psychological

[1] The influence of phenomenalism and positivism upon moral and social science was likewise to further some of the tendencies already described. In particular, they favored the growing utilitarianism especially of the English political and moral theorists.

(and even biological) standpoints when earlier thinkers would have chosen other points of departure. In this way it has tended to make art, morality, religion, political theory, law, logic and in general philosophy mere branches of psychology or even of biology. Indeed, the very basis of the universe has been conceived by subjectivism in terms of the biological adaptation of man to his environment or in terms of human instincts and their satisfaction.

CHAPTER XXV

THE DOCTRINE OF EVOLUTION

1. Introductory.—The seventeenth and eighteenth centuries witnessed, as we have seen, the rise of modern intellectualism and its subordinate philosophical movements, mechanistic naturalism, rationalism, phenomenalism, positivism, and idealism. The nineteenth century in turn witnessed the rise of the doctrine of evolution and of the romantic reaction against intellectualism. On the one hand, the doctrine of evolution extended the older intellectualism by adding to it new philosophical interests, problems and hypotheses of highest importance. On the other hand, romanticism liberated the life of feeling and emotion suppressed during the age of reason. Let us consider first the rise of the former doctrine, the theory of evolution.

The rapidly growing knowledge of the eighteenth century forced upon the attention of scientists more and more imperatively the problem of the origin of man's world, that is the origin of the solar system, the origin of the earth and her present surface, the origin of life and its innumerable forms, the origin of man, of his mind and of his civilization. Thus from the late eighteenth century to our own time the following questions commenced one after the other to concern the intellectual world. How did the solar and sidereal systems arise? How did the crust of the earth reach its present structure and character? Whence arose the species of animals and plants? What was the origin of man and what has been the origin of his customs, laws,

institutions, arts and beliefs? If naturalism was to be a consistent and adequate philosophical conception of the world, it had to include an account of the rise of all these things and it had to explain this rise by naturalistic premises. Still here as elsewhere thought moved slowly and by stages. Only slowly could the new naturalism expand into fields still occupied by traditional and prescientific belief and only gradually could it recognize the presence of the many problems of origin and development implicit in its very earliest subjects of research.

The first definite attempt to explain the origin of any of these entities by appealing to the results of genuinely scientific research was, as we should expect, in the most advanced science of the day, namely, in gravitational astronomy. Kant and Laplace share the honor of offering to the world the nebular hypothesis, a distinctly naturalistic effort to explain in the terms of mechanics instead of the terms of supernaturalism the origin of our solar system.[1]

At the same time the increasing knowledge of the surface of the earth, of its strata, and of the fossils contained in them were forcing geologists to attend to the problem of the historical origin of the earth's present surface and of the animal and plant life it supports. The same problem forced itself upon the attention also of zoölogists and botanists. In short, in the late eighteenth and early nineteenth centuries the problem had become pressing because of the vast store of geological and biological information that could not be adequately systematized and explained by the prescientific and traditional theories of creation.

Finally, in the early nineteenth century, an increasing

[1] It is interesting to notice, however, that this same thinker Kant despaired of science ever being able to account naturalistically for the rise of plant and animal life.

interest developed in all that we call the history of man. The older intellectualism had turned men to the study and imitation of classical art and literature; but now the dawning romanticism turned men to the study of the middle ages, and of the folklore and folk customs of northern Europe. A far better acquaintance with the eastern peoples, their customs and arts, their literature and religion, and especially with the civilization of India was also awakening an interest in the origin and development of language, literature, art, and religion. Finally, political and social history and science were becoming more evolutionary in the problems they raised and in the subject-matter they studied. Thus, from astronomy to the sciences of society and civilization a growing interest developed in the problems of genesis and origin.

For further study read:

Royce, Spirit of Modern Philosophy, 273–304;
Merz, J. T., History of European Thought in the Nineteenth Century, Vol. II, chapter IX.

2. Geological and biological evolution.—Of these fields of research that of geology and biology was strategically the most important, for here the rise of the doctrine of evolution was to modify radically the philosophical thought of Europe and America. The strategical importance of this field is easily explained if we recall that it included most of what both prescientific and even intellectual men have in mind when they speak of creation; that is, it included the development of the earth as the habitat of man, beast and plant, the development of life upon the earth and finally the origin and prehistory of man himself. Thus it included the great arena in which religion in all the ages has found especially the combat between the forces of good and evil and the consummation of the divine drama. Finally, the field of geological and

biological evolution included the most conservative survivals of prescientific belief, and therefore the field into which the naturalism of the preceding two centuries had hardly penetrated. Here, in other words, the great body of European thought and belief still remained prescientific.

The rise of the doctrine of evolution in geology and biology is associated pre-eminently with the names of Lyell and Darwin, though these thinkers were of course but leaders in a movement older than they and in a movement steadily advancing in the direction in which they were to hasten its progress. However, the vast influence of the two books, Lyell's *Principles of Geology* (1830–33) and Darwin's *Origin of Species* (1859) is more easily underestimated than overestimated; for they were philosophically the most important books written in the nineteenth century. Before their years of publication few men were evolutionists and fewer men were evolutionists in many fields; whereas by the end of the nineteenth century the entire intellectual world had become evolutionistic, and evolutionistic not merely in geology and biology but in every field of historical research and in every field of deliberative effort to advance civilization. Indeed, to view all things from an evolutionistic standpoint has become virtually an element of commonsense.

But what constituted the philosophical advance made by these great books? First, they extended naturalism to fields that up to the time of the appearance of these books were the most difficult for man to conceive in naturalistic terms and that therefore man had continued to conceive in supernaturalistic terms. Now "natural" means capable of scientific explanation and so the preceding statement may be re-expressed thus: these books enlarged the field of scientific explanation to include the origin of the world which forms man's immediate habitat and the origin of man and his civilization. Thus they taught men to think

of themselves, body, life and mind and of their civilization and of all that it includes as genuinely natural, natural in origin, natural in development and natural in destiny. They taught men that man's world is as truly a part of nature as is the system of mechanical forces exemplified in the solar system. Second, they taught men that the processes now actually observable in nature can account for origins which previously seemed to require radically different processes, if not even supernatural processes. The same erosion now observable in nature, if given time, can level mountains from whose debris in turn vast deposits can be built. The very pressures now observable can create mountains and make faults and earthquakes. The variations in species actually observable and the observable survival of the fittest enabling these fittest to procreate the next generation can account for the origin of new species from the old, can account for the dying out of types of animal and plant and can account for the innumerable variety of types to which an earlier type can ultimately give rise. Third, these books opened the eyes of men to the complete genetic continuity in nature. This continuity had been long taught in the abstract by naturalistic thinkers but here it was given in the concrete and exemplified where least expected. Now genetic continuity became explicitly the object of search in every science which dealt with the origin and development of anything whatsoever, be it a mountain or a part of a mountain, be it a genus or a specific animal's body or a part of his body, be it a language or a word in a language, be it a civilization or a custom within a civilization, be it a religion or a specific rite or belief in that religion, be it a government or a specific institution within that government, the common law or a specific decision in the history of the law, architecture or a specific building, the drama or a play of Shakespeare. All now were studied with the expectation of

finding a genetic continuity between what is and what has been.

Of course, Lyell and Darwin left to the next generation of scientists vastly more problems than they themselves solved, and they left solutions which may one and all in the long run prove erroneous; but what they did leave settled was the progress of naturalism. Naturalism may or may not be a sound philosophy, that is a matter which history can decide but not the historian. Our point is solely that from these days naturalism thoroughly understood her own ambition, saw what might be expected of her and viewed the future with confidence. Moreover, naturalism was now in a position really to win the intellectual world and to convince intellectual men that the world about them and they themselves are genuinely the proper objects of scientific explanation.

3. The doctrine of natural selection.—To this account of the bearing of geological and biological evolution upon the more general doctrine of naturalism we must add a brief statement of Darwin's doctrine of natural selection; for it has played not merely the part of a special biological hypothesis but also the part of a general, or philosophical hypothesis. The biological doctrine of natural selection may be stated thus: To reach maturity and to be able to leave offspring any living creature must meet those conditions of its environment which not to meet would mean its death. It must secure the indispensable food, it must escape its enemies and it must protect itself against all other death-causing agents, living or lifeless. Now no such perfect adjustment between organisms and their environment obtains that the aforementioned conditions cease to be a serious matter; rather all species have a high death rate before maturity and in most species this death rate is enormous. Hence in most species the individual that survives long enough to leave offspring is highly

exceptional. As special evidence of this fact consider that all species tend to reproduce their kind far beyond the available food supply and even far beyond the available area of the habitat. Consider, for example, the rate of reproduction in such types as the insects, the fish, or the bacteria or the fruit trees in which in a few generations the mathematically possible offspring from one seed, spore or ovum would be millions in number. Consider in contrast the fact that the actual number of plants or animals in any habitat is usually all but constant. These two facts can be harmonized only by the hypothesis that very few ova or seeds develop into fully mature creatures. The number perishing between the first stage of life and the mature stage must be enormous. That is to say, the conditions of the environment, or nature, selects out of any generation the few that are to survive and leave offspring. But which are thus selected? The correct reply is the truism: Those best adjusted to the environment, those most fitted to the actual conditions, however accidental these conditions may be. If then any exceptional trait is possessed by part of any species, a mutation, for example, that gives the individuals possessing it an important handicap fitting them better than their fellows to the specific conditions of the environment; then the chances are highly in favor of the few who do survive, including some of these with the valuable new trait. Hence, finally, wherever a valuable trait does arise, other things being equal, it survives to the next generation; and in time only those possessing this trait do survive. In short, the old species has disappeared and a new variety has taken its place.

Whether or not this doctrine of natural selection can explain all that the biologists of Darwin's generation thought it could, is in no way my question. What I wish to point out is the fact that this doctrine became rapidly

generalized and then widely used in the sciences. Generalized the doctrine of natural selection asserts: Of the innumerable entities which come into existence some are so favorably adapted to the conditions of their further survival that they persist and tend to become typical; whereas others not favorably adapted perish and fail to become typical. Now we have in the doctrine of natural selection thus generalized a principle that applies to innumerable entities which form part of human history. For example, it applies to all customs and beliefs, to tools and machines, to words and idioms, to architecture and art, to types of literature and literary style, to laws and institutions, to scientific theories and principles, to religious rites and dogmas, to methods of commerce, industry and banking, to forms of dress and adornment, to methods of education and to professional callings and to the innumerable other arts, customs and institutions that constitute the life and the culture of a people. Similarly it applies to the development of habit in the individual mind. The habits of any adult are the resultant of a natural selection taking place from childhood. On the one hand, this process eliminates response after response that does not lead to satisfaction or does lead to annoyance; and on the other hand, it allows to survive as habits those responses that are satisfying. For example, that you and I speak English and not some jungle dialect is due to such a natural selection, that we have the etiquette and morals of civilized whites and not of wild people is again due to this factor, and finally, that we think more or less logically and not altogether hysterically or childishly is likewise the result of this same process of selection. Moreover, not only can the survival of entities that are peculiarly human or biological be thought of in terms of natural selection, but also the survival of solar systems and chemical atoms and chemical molecules and compounds.

In short, any structure, chemical or physical, is an equilibrium of forces depending upon environmental conditions and its adaptation to those conditions for its survival. However, it is chiefly in the biological, the psychological and the social, the political, the economic, the moral and, in general, all historical sciences that the doctrine of selection has become an important philosophical principle.

For further study read:

Judd, J. W., The Coming of Evolution, 1910;
Thomson and Geddes, Evolution (Home University Library);
Romanes, G. J., Darwin and after Darwin, 1901, Vol. I;
Merz, J. T., History of European Thought in the Nineteenth Century, Vol. II, chapter IX.

For more extensive study read:

Osborn, H. F., From the Greeks to Darwin;
Darwin, Origin of Species.

4. Evolution as a part of the philosophy of the intellectual world.—The winning of the intellectual world to evolution was not without a fierce struggle comparable to the struggle that centered about Galilei. But to-day this struggle is happily over. Evolution is an integral part of our habits of thought almost as much as are the multiplication tables; for we are literally evolutionists in every branch of historical study and are so as a matter of course. The sciences of geology, biology, psychology, sociology, anthropology, philology, political history, the history of art, of literature, of religion, of law and social institutions are one and all evolutionistic and have become such during the fifty or sixty years since the publication of the *Origin of Species*.

For further study read:

Höffding, History of Modern Philosophy, 434–485.

For more extensive study read:

Spencer, H., First Principles;
Fifty Years of Darwinism, 1909.

5. The influence of evolution upon the general trend of present philosophic thought.—With the years immediately succeeding the publication of the *Origin of Species* we enter the period reserved for a later chapter of this book; however, let us notice here one highly general philosophical influence of Darwin.

Modern experimentalism really began, as we have seen, with Galilei; but experimentalism made its way only slowly from field to field and did not reach the goal of being a general philosophy until our own time. Here Darwin has certainly helped more than any other man. Directly or indirectly he has taught the succeeding generations that the entire intellectual enterprise of man is itself an evolving and therefore tentative or an experimental undertaking. Rationalism with its fixed axioms and its optimism regarding man's ability to reach quickly the goal of any science or the final solution of any problem seems to most intellectual men of to-day absurdly presumptuous. We feel our way onward distrustful of utopianism or finality in any form or guise, be it final scientific hypotheses or final moral codes or final political theories or final ideals of art or literature or final theologies. In short, the philosophy of our intellectual life and of our moral and practical life is filled with the spirit of trial and error, of struggle for existence, and of survival of the fittest, that is, of evolution by natural selection.

For further study read:

Dewey, J., The Influence of Darwin upon Philosophy, 1910, Chapter I.

CHAPTER XXVI

ROMANTICISM

1. Introductory.—Thus far in the history of modern philosophy we have studied the several tendencies within the intellectualistic movement. We have now to study the anti-intellectualistic, or romantic movement which arose in reaction against intellectualism.

Not only did the rise of modern science fail to eliminate a large part of prescientific belief and custom but it failed also to suppress completely medieval religion, emotion and art. True, these latter remained somewhat in the background during two or more centuries, while the new and powerful tendencies in European thought played their part. As we have seen, in the seventeenth and eighteenth centuries classicism in art and literature, naturalism in science, and rationalism in religion were prominent in the intellectual life of Europe; but the eighteenth century witnessed also a revival of the spirit of the medieval northern peoples. This change appeared first in the revival of emotional religion, in the pietist movement in Germany and the methodist movement in England. These religious movements were reactions against the cold rationalism and formalism of the older protestant churches; and characteristically they demanded of men a deep emotional religious experience and appealed not to man's intellect but to his heart and religious intuition; and characteristically, they succeeded first among the folk rather than among the intellectual classes. Late in the eighteenth century and early in the nineteenth romanticism began to

appear also in literature and in the revival of interest in the folk customs, ballads and legends. Again, it appeared in the revival of interest in the middle ages and in catholicism. Finally, it appeared in a new interest in the Orient, her religion, her thought, her languages and literature.[1]

2. Romanticism as a philosophical movement: (a) Rousseau.—In the French writer Rousseau romanticism began to appear as an explicit philosophical movement, which fact together with Rousseau's widespread and powerful influence upon European thought makes him one of the most important of modern thinkers. Briefly stated, the important philosophical principle maintained by Rousseau was: "Morality and religion are not matters of reasoned thinking, but of natural feeling. Man's worth depends not on his intelligence, but on his moral nature, which consists essentially of feeling; the good will alone has absolute value." That is to say, the sentiments are the important element in our mental life, and it is not through the development of intelligence that man becomes perfect but through the development of feeling; for the ideal man is he that is filled with sympathy for his fellows and is "inspired by religious feeling, gratitude, and reverence." [2]

(b) Kant, Fichte and their successors.—Influenced by Rousseau, Kant and Fichte expressed the same principle.

[1] Some familiar nineteenth century examples of the new movement are the following:—the interest that led the brothers Grimm to collect the fairy tales of the German peasantry; the romances of Walter Scott; the poetry of Wordsworth, Coleridge and Keats; the Oxford movement in the Church of England toward medieval catholicism under the leadership of the great English thinker and writer John Henry Newman and his associates; the revival of gothic architecture in England and America reacting against the classical architecture of the eighteenth century; and finally, especially in Germany, new interest in the study of the historical development of language and in general the rapidly rising interest in historical research of every kind.

[2] Quoted from Thilly, History of Philosophy, p. 389.

In Kant's words:—"Nothing in the whole world, or even outside of the world, can possibly be regarded as good without limitation except a *good will.* No doubt it is a good and desirable thing to have intelligence, sagacity, judgment, and other intellectual gifts, by whatever name they may be called; it is also good and desirable in many respects to possess by nature such qualities as courage, resolution, and perseverance; but all these gifts of nature may be in the highest degree pernicious and hurtful, if the will which directs them or what is called the *character,* is not itself good. The same thing applies to *gifts of fortune.* Power, wealth, honor, even good health, and that general well-being and contentment with one's lot which we call *happiness,* give rise to pride and not infrequently to insolence, if a man's will is not good; nor can a reflective and impartial spectator ever look with satisfaction upon the unbroken prosperity of a man who is destitute of the ornament of a pure and good will. A good will would therefore seem to be the indispensable condition without which no one is even worthy to be happy.

"A man's will is good, not because the consequences which flow from it are good, nor because it is capable of attaining the end which it seeks, but it is good in itself, or because it wills the good. By a good will is not meant mere well-wishing; it consists in a resolute employment of all the means within one's reach, and its intrinsic value is in no way increased by success or lessened by failure." [1]

With Kant and Rousseau Fichte asserted the primacy of the will, and adopting an outright idealism he found in the will struggling for the good the very central fact of the universe. The universe is an eternal struggle for righteousness and by so viewing it man can comprehend the very essence of all things.

Among the successors of Kant and Fichte in the move-

[1] Watson, Selections from Kant, pp. 225 f.

ment called German idealism the greatest romanticist was Schopenhauer. Schopenhauer taught that the will, or the instinctive and impulsive nature exhibited in our human minds reveals the very essence of the universe and of all its processes and contents. From the inanimate up through plant and animal to man we behold everywhere the blind struggle to exist and to take on characteristic forms. In the vastly greater part of nature this will is blind, but in man it becomes self-conscious. Thus every event, or transformation in nature, man or society, is interpreted as the striving of the will. It may be a magnetized needle pointing north, or a tree sending its roots deeper into the soil, the beast of prey seeking his game, man struggling for fame, or society warring for empire, one and all are but the acts of the primordial will, the very stuff of which the universe is made.

This will to live and to transform is capable of both an optimistic and pessimistic interpretation. Kant and Fichte had given the optimistic interpretation; whereas Schopenhauer is the famous apostle of the pessimistic interpretation:—"The will to be, the will to live, is the cause of all struggle, sorrow, and evil in the world." It is the cause of the ceaseless competition for life between one thing and another. It is the cause that makes life selfish. "The life of most men is but a continuous struggle for existence,—a struggle which they are bound to lose at last. . . . Death must conquer after all." In such a world true morality teaches as the supreme virtues, sympathy and pity. Man must suppress his will, his selfish desires, "in order to enjoy happiness or at least to be at peace. This is possible in several ways. The artistic or philosophical genius may be delivered from the selfish will, forget himself, lose himself in artistic contemplation or philosophical thought. . . . The individual can also free himself from his selfish will by contemplating the

futility of all desire and the illusoriness of individual existence. . . . The best way is total negation of the will in an ascetic life, such as is practised by Christian ascetics and Buddhist saints. Resignation and will-lessness ensue, the will is dead." [1]

While romanticism spread to Germany through the influence especially of Rousseau's writings and while it continued there to inspire the German idealism, it was spreading also in France and from France and Germany to England. Thus by the early nineteenth century it had become a distinct trend in European thought.[2]

3. Romanticism as a philosophical doctrine.—Behind romanticism as a philosophy are two principles. First, man is not fundamentally intellectual. Rather he is fundamentally a creature with instincts and feelings; and his instinctive and emotional life should dominate his career and give him the principles of both his conception of the world and his conception of life. Expressed in other words, the poet or the saint is a truer and better guide in the great enterprise of human life and thought than is the scientist. Religion, morals, art, literature, social and political philosophy, and education should recognize this fundamental fact of human nature. Religion is not a sort of mathematics or chemistry to be

[1] Thilly, History of Philosophy, p. 490.

[2] Among the prominent earlier thinkers allied to the Romantic movement were the following: Rousseau (*fl. c.* 1750); Kant (*fl. c.* 1765); Jacobi (*fl. c.* 1785); Fichte (*fl. c.* 1800); Schelling (*fl. c.* 1815); Hegel (*fl. c.* 1810); Schleiermacher (*fl. c.* 1810); and Schopenhauer (*fl. c.* 1830). The great leaders of early Romanticism in German literature were Herder, Goethe and Schiller. Among early French and English literary romanticists were: Bishop Percy (whose "*Reliques of Ancient English Poetry*, published in 1765, has justly been described as 'the Bible of the Romantic reformation'"), St. Martin (in religion), Madame de Staël, Chateaubriand, Lamartine, Lamennais, Hugo, Gautier, Cowper, Blake, Burns, Walter Scott, Wordsworth, Coleridge, Lamb, Keats and Shelley.

proved and taught by argument and evidence. Rather it is a matter of the heart to be believed because religious intuition finds it true and to be accepted as the controller of men's lives because their hearts have been won over to it as the greatest and most satisfying adventure upon which can man enter. Theology and dogmas, formal religion and its institutions contradict the true spirit of religion and even rob the religious life of its true inwardness. True religion and undefiled can dwell in the simplest life and in the humblest of intellects and expresses itself in the good will, in the life of gentleness, faith, courage and sweetness, in devotion and self-sacrifice, in love and in otherworldliness and in the contemplation of the divine. Morality again is not a science but is essentially the good will and conscientiousness. The humblest man intellectually is as capable of being good as is the wisest. In art romanticism expresses itself in a disregard of form and in a richness and exuberance of feeling and sentiment. It loves nature rather than cities and culture, exalts the sentiments of the lover and the picturesque life of the peasant and the lowly, is interested in adventure and self-sacrifice and is filled with a sense of the mystery of life and reality. The same traits characterize its poetry and other literature. In its political theory it sees not in man's social life a contract or a cold-blooded enterprise governed by self-interest and intellect. Rather it beholds in society a vast organism in which all men are members one of another, an organism governed by its instinctive ideals and pressing onward toward their realization without seeing explicitly and concretely what these ideals are. In education it refuses to regard the child's mind as an empty tablet on which civilization is to write its artificial and arbitrary lessons. Instead, the child's mind is an unfolding mind with its own natural course of development and its education should not be forced on it from

without but should be governed by the child's own native impulses and interests. The child has its own rights, its rights to be a person self-directed and self-instructed; and these rights are prior to those of artificial culture. Finally, to romanticism the real world is not the world of atoms and scientific abstractions but a world full of life, overflowing with life and with feeling, a world seen and felt by man's heart but hidden from man's scientific research.

Second, behind romanticism is the dawning and later the explicit recognition of evolution everywhere in nature and in the life of man. The world and the living creature are not machines or mathematical puzzles but growing entities. Life is therefore a truer and philosophically a more genuinely fundamental principle than is the mathematical and mechanical. Better as a philosophical notion even than life is mind with its instincts, or the will in the broad sense that includes the instinctive impulses. The world is not scientific, rational or logical. Whatever the place and value of science, it is false if taken literally as a description of the real. The world cannot be described in terms of concepts; rather it can only be intuited and felt. Thus perceived it is an evolving will, a will driven onward by its own impulses, a will struggling to realize its own blind yearnings, a will infinitely rich in the variety and profusion of its creations. The same will is seen in man and his career. Man's history also is the evolution of a will, a will that is blind and instinctive, a will governed not by foresight but by longing. Thus human history is a mighty onward movement whose goal cannot be foreseen or even wisely directed by man's intellect. Whither it goes we cannot foretell. The best we can do is to see whence it comes, and to do this we must study the instincts and the heart of man.[1]

[1] This extreme anti-intellectualism has not been shared by all romanticists. Evolution has its formula. The famous instance of

For further study read:

Royce, Spirit of Modern Philosophy, 164–189;
Watson, Selections from Kant, 225–258;
Fichte, Vocation of Man;
Höffding, History of Modern Philosophy, Vol. II, 139–289;
Morley, Essay on Rousseau.

For more extensive study read:

Schopenhaur (transl. Haldane and Kemp), World as Will and Idea;
Whittaker, T., Schopenhaur, 1909;
Wallace, W., Life of Schopenhaur;
Benn, History of English Rationalism in the Nineteenth Century.

belief in such a formula is the doctrine of the great German philosopher Hegel and of his school. The universal formula of evolution, according to Hegel, is the same as that of the evolving individual reason. That is to say, all things in nature and in human society exhibit in their evolution the same succession of stages as does the child's intellect developing into the intellect of the mature and wisest philosopher. By discovering therefore this formula the philosopher becomes a universal scientist, for he has discovered the most important secret of the universe, its very essence and law, a law exhibited in the development of everything. What is according to the Hegelian the law of the developing reason? The chief characteristic of the child's knowledge is its one-sidedness. It fails quite to see the complexity of any problem it tries to solve and therefore reaches absurdly simple solutions. As its knowledge increases it sees some of the other sides of these problems, the contradictory aspects, that is, contradictory to the aspect first seen. The child may now make the error of being one-sided by favoring its new discovery and may solve its original problem by going to the opposite extreme. However, if the child continues to grow in wisdom it will see many sides to the complex matter in which it is interested and will gain a view that is itself many-sided. It will get solutions to its problems which harmonize or synthesize the many aspects of the things studied. Stated as a formula, intellectual development is a passing from one-sided beliefs to beliefs that are many-sided, to beliefs that give coherent, synthetic or all inclusive insight; and the final goal of intellectual development, the perfect intellect, is the completely coherent and all inclusive knower, the knower who takes all things or

4. Romanticism and science.—As romanticism in other periods of human history reacted against science and naturalism; so has nineteenth century romanticism. Romanticism brings the general charge against science that it has robbed man of his spiritual life, that it has

aspects into consideration, who is perfectly consistent, or coherent, who sees the world in its infinite complexity yet sees it as a unity, as a perfectly coherent system, as an organic unity including infinite diversity.

Correspondingly all evolution proceeds in one direction only to take later the opposite direction and finally to combine and reconcile the two tendencies. In short, evolution is a harmony of discords, is a synthesis of opposites. Nature and life and society never move in straight lines. If they did they would remain simple; but they gain the complexity and rich variety which they always exhibit by the fact that they are constantly moving in opposite directions, then harmonizing these opposites only at the next stage to create opposites again and so on until infinite diversity harmonized in unity is reached in the universe's ideal goal.

This formula is not merely that of existence but also that of the Hegelian's whole system of values, his formulas of the good and the beautiful. Perfection means unified diversity, the complete reconciliation of opposites. The good life is not the simple life but the life that has a wealth of diversity and also harmony, consistency or coherence. Moreover, as the very law of universal evolution is a passing from a lower stage toward the perfect, the Hegelian is a thorough optimist. The world itself is good and beautiful and perfect, all evil is finally reconciled and made good in the ultimate unity of all things, all discord and ugliness and imperfection disappear as our knowledge goes on from stage to stage and we see things coherently. Thus if the world seems evil, it seems so only because we are still children with one-sided knowledge, for were our knowledge perfect all would be seen to be perfect.

Here arises in Hegelianism the usual distinction made by mysticism between the world as it seems and as it really is. The world that we see with our childish eyes is mere appearance. In order to see the true world, reality, we have to become philosophers. In short, this particular type of romanticism, like the mysticism of the middle ages and of Hellenism, ends by giving us the heavenly vision, the vision of the world not as it appears to sense or to science but as it appears to some super-rational faculty.

impoverished his emotional life, that it has transformed his religion into atheism or a mere formalism, that it has deprived his art of beauty or has put utility in the place of beauty, and finally that it has utterly deceived man by giving him a merely artificial abstract scheme called science and by identifying this abstraction with reality. This last charge is the most serious philosophically, for naturalism claims at least a firm grasp upon fact and reality. Briefly stated, the grounds of the charge made against science as a theory of reality are these: Science employs as her chief methods analysis and abstraction, whereas reality is organic or concrete and in either case defies analysis.

As organic, reality defies scientific analysis, formal logic and the type of explanation that presupposes these. Reality is an organic unity. It is not a whole made up of parts. The parts are not related to one another externally but internally. Each is genuinely a member of the other and is what it is because of the others. As our hand cannot exist without the rest of the body and as our hand is what it is because of its relation to the whole body; so every part of reality is what it is and even exists only because of its membership in the whole. In other words, reality can be understood only in its entirety. Let me repeat, reality is a unity. The so-called unity of the special sciences is a mere mechanical unity not a genuine unity, rather it is a mere assemblage of parts any one of which could be different without forcing the other parts to change. The genuine unity is organic and as such has to be viewed from the standpoint of the whole. Thus, however valuable science may be as a utilitarian instrument, it essentially belies the very nature of reality if used as a theory of reality. Science analyzes, science deduces, science is abstract; whereas reality is essentially unanalyzable, reality can be understood only as a whole,

reality is concrete. Such is the typical Hegelian protest against the special sciences taken realistically.

Another typical protest of contemporary romanticism [1] against science is that science reduces the world to the static and abstract world of mathematics. The fundamental notions of science are logical and static and her formulæ are true only of a static mathematical world; whereas reality is alogical and dynamic. Science is fundamentally not evolutionistic but mechanistic; for science seeks to explain and to explain is to deduce and to deduce is to assume that the premises are sufficient and this finally is to assume with mechanics that the future is but a changed configuration of the past. In contrast, reality is fruitful, is spontaneously bringing into existence the absolutely new and is essentially inexplicable.

Science is logical and static. Science seeks entities that do not change, science seeks constant laws, science seeks to eliminate every change except that of motion, and science seeks to reduce every problem to one in mathematics. In short, science is mathematical, but reality is distinctly non-mathematical. Qualities, intensities, durations, the good and the beautiful, life and growth, change and development defy mathematics. They defy even measurement.[2]

[1] The Hegelian protest is still partly intellectualistic whereas this protest is frankly anti-intellectualistic. As such it is more closely related to the thought of Schopenhauer than to that of Hegel and has received its most powerful and thorough presentation in the writings of the noted contemporary philosopher Bergson.

[2] When we pretend to measure any of these entities, we always substitute for it first a mathematical entity. For example, when we measure time, we substitute the spatial, as the arc of the heavens through which the sun has moved. Pure time is not motion through space and simply cannot be measured. Take another instance. We pretend to measure temperature by means of a thermometer, but what the thermometer really measures is the length of a column of mercury; and even though this length is related to temperature, the

Science is not evolutionistic, whereas reality is. The so-called evolution of science reduces merely to the changing position of ultimately constant entities as is quite apparent in celestial mechanics. Genuine evolution means a budding, a bringing forth, a creation, the arising of the new, the onward rush of impulse and history. To say that there is no such evolution is to deny our most intimate experiences, is to deny the self-evident. As we ourselves live and grow, as we think and strive, as we are driven by impulse and desire, we experience the very essence of the real, a reality that defies mechanical explanation.

For more extensive study read:

Bergson, H. (transl. Mitchell), Creative Evolution, 1911;
Bergson, H. (transl. Pogson), Time and Free Will, 1910;
Bergson, H. (transl. Hulme), Introduction to Metaphysics, 1903;
Joachim, H. H., The Nature of Truth, 1906.

5. Romanticism and primitive thought.—Romanticism, in contrast with intellectualism, has a marked respect for the folk mind and the group mind. It believes in the heart of man, in the intuitions of the peasant and in the instincts and the *total* mind of the human being. All of man's nature is to be satisfied and man is more than intellect. This makes romanticism not only fond of the natural and primitive but also confident of their right to be and of their right to rule, and not only reverent toward the religion of the folk but also credulous of the innate wisdom and correctness of the group mind. It is thus socialistic and not individualistic as is intellectualism. Even civilization, so admired by intellectualism, is distrusted as artificial by the romanticist. In the language of a true romanticist, George Tyrrell, civilization is a

relation defies being reduced to any mathematical formula and thus the temperature always escapes being measured.

clearing in the jungle or an artificial garden. It can exist as long as we are able to keep the weeds under control; but if we neglect our garden for a month and return we shall see that it is overgrown with weeds. Moreover, in the long run the jungle will conquer in spite of man's intellect, care and labor. In this figure, the world is the jungle, primitive man is the jungle, the instinctive nature of each of us is the jungle; whereas man's intellectual enterprise is the clearing or artificial garden. Let us then recognize not only the hopelessness of the struggle to make man thoroughly intellectual but the absurdity, error and blindness of trying. For example, take religion. Religion is the product of the group mind. Religion came out of the jungle. It cannot be made the artificial thing that intellectualism has tried to make it. Religion is essentially primitive and must forever remain such if it is to continue to be the religion of the people. Magic, myth, ceremonial and mystery are its very essence; whereas religion robbed of these is a mere petrified vestige of what was once religion.

A similar truth holds of society. Intellectualism creates policies that are utterly utopian and impossible. The group mind with all its instinctive and blind impulses is the true power creating the state and the culture of society. Human history is not the result of rational foresight but of impulse and blind groping in which the group mind is seeking to satisfy all the needs of man. And remember that these needs are revealed in the instinctive man and are not the discovery, or creation of reason. Finally, a similar truth holds of the entire human enterprise. It began in the jungle and it will end in the jungle. It can never successfully be naturalized in the artificial gardens of civilization and intellectualism.

Therefore says the romanticist, the intellectualist may well respect the primitive mind and the group mind; and

whether he does or not, they will persist and will in the end control him. However, let him not yield to these primitive and group minds grudgingly; rather let him see that they alone deserve confidence, for they alone are right and truthful, they alone have seen man thus far on his long journey and they alone are able to see him to the journey's end.

6. The influence of romanticism upon the thought of the nineteenth century.—The influence of romanticism upon the thought of the nineteenth century can hardly be overestimated. The eighteenth and nineteenth centuries stand in marked contrast in almost every field of spiritual life, and this difference of attitude is due preeminently to the romantic movement. The chief places in which the new attitude has manifested itself, have been already mentioned: art, literature, religion, and the numerous departments of historical research. The revival of gothic architecture, the love of nature, the interest in the folk-life and customs, the appeal of romantic passion and the fondness for content as opposed to form illustrate the change in art. The romantic poetry of Burns, Wordsworth, Coleridge, Shelley and Keats and the fiction of Scott, Hugo and Dumas illustrate the new attitude in literature. Methodism, the Oxford movement in the Church of England and the general revival of the spirit and emotions of medieval religion illustrate the transformation that has taken place in the religious life. The universal interest in the past from which the modern world is descended, in its life, customs, art, language, literature, religion and institutions illustrate the extreme change from the narrow interest of the eighteenth century in the future and in the utopian belief in human perfectibility.

Such differences indicate not merely superficial changes but such fundamental changes in thought and feeling as we have called philosophical. Without difficulty and with

conviction, numerous intellectual leaders in the nineteenth century and the thoughtful people whom they have influenced, think of the world in terms of life and will rather than in terms of mechanics or physical science; and the immanent God of pantheism has become almost a popular belief. Spinoza, Hegel, Schopenhauer and, in our day, Bergson receive widely a hearing, while a hearing is but grudgingly given to the apostles of the Enlightenment and the French Revolution. All of this has meant a radical change in the method and means by which thoughtful men endeavor to justify to themselves what they believe and what they hope, from the means and methods employed, for example, by Descartes and the eighteenth century religious thinkers. In a sentence, the primacy of the heart and will over the intellect, and the intuition of the mystic are respectively typical principles and typical courts of ultimate appeal in the philosophy of the nineteenth century.

For more extensive study read:

McGiffert, A. C., The Rise of Modern Religious Ideas, 1915;
Eucken, R. (transl. Pogson), Life of the Spirit;
Eucken, R. (transl. Gibson), The Meaning and Value of Life;
Inge, W. R., Christian Mysticism, 1899;
Tyrrell, G., Lex credendi, 1906; Lex orandi, 1904; Through Scylla and Charybdis, 1907;
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CHAPTER XXVII

PRESENT PHILOSOPHICAL TENDENCIES

1. Introductory.—The field of study in this chapter is approximately the past fifty years, the last third of the nineteenth century and the beginning of the twentieth century. In this brief period is to be found all that is older in philosophic thought and much that is new; and the old and the new together make present philosophic thought extremely varied and highly composite. On the one hand, all the earlier movements from the very beginning of modern times have survived into the present. On the other hand, genuinely new elements or movements have become prominent in the last fifty years and have given the present age a characteristic and peculiar trend. On the one hand, we are children of the past and exemplify various inherited strains of older philosophic thought. On the other hand, the past fifty years are as great for genuine philosophical progress as for scientific discovery and utilitarian invention. The total resultant of these many movements has made us philosophically different even from the Europe and America of only fifty years ago.

With Europe of the eighteenth century we share the older rationalism and mechanistic naturalism, the older phenomenalism, positivism and idealism; and with Europe of the nineteenth century we share the evolutionistic philosophy and the romantic philosophy. On the one hand, the French Revolution and all that it connotes in the life of Europe of a hundred years ago is still a genuine element in our present spiritual, intellectual, moral and

political life. On the other hand, romanticism and evolutionary philosophy have become prominent and powerful elements to be found throughout the intellectual and practical life of the western world. But at the same time the change in the philosophy of the intellectual world from that typical of the late eighteenth century to that typical of the late nineteenth is immense. Besides romanticism and the evolutionary philosophy whose influence in producing this change I have already discussed, there remain, it seems to me, four prominent factors to be studied in this chapter. First, there is the philosophical influence upon the older naturalism of the exceeding numerous discoveries in the mathematical, physical and biological sciences. Second, there is the outgrowing of the older rationalism and the rising in its place of experimentalism and the allied intellectual attitudes, a change due not only to the evolutionary philosophy but also to the growth of the field of experimental research. Third, there is the appearance of efforts to go back beyond Cartesian dualism and all its resulting philosophies, which means to go back beyond Greek science and to interpret anew in the light of modern science the facts of mental life. Fourth and last, there is the great moral and political change from the *individualism* of the older democratic movements of the eighteenth century to the *implicit socialism* of contemporary moralists and political theorists and leaders.

In the first place, *the world has come to seem to us vastly more complex* than it did to Laplace and to his contemporaries who entertained the mechanistic naturalism founded on mechanics and the gravitational astronomy. It may be that mechanistic naturalism will be victor in the long run; but even so, the scientist of to-day apprehends how very far we still are from knowing the complex world revealed to us in physics, chemistry and physiology to be explicable solely in terms of the propositions and notions of mechan-

ics.[1] In the second place, the intellectual optimism exemplified in the *rationalism* of the seventeenth and eighteenth centuries has come to seem quite adolescent. *Experimentalism* and, in the broadest sense of the word, *pragmatism* are to-day characteristic philosophical attitudes taken by intellectual and scientific leaders in the world of thought. In the third place, though the vast majority of intellectual men are still *Cartesians* in their psychological thought, distinct signs are visible among biologists, psychologists and philosophers of dissatisfaction with and perplexity about the pre-scientific conception of the mind persisting in Cartesian dualism and in its logical consequences. *Behaviorism* and in particular *a new realism* are offered to supplant the subjectivism of the seventeenth and eighteenth century phenomenalism and idealism. Finally, a new social religion has been spreading throughout industrial democracy, a religion that may be called, in the broadest sense of the word, socialism, supplanting the individualism of the older liberal and in particular supplanting his belief in ruthless competition.

Let us select as the subject of this chapter these four matters which seem to be the four new and major factors (in addition to romanticism and the doctrine of evolution) in producing the marked change in philosophic thought that has taken place during the nineteenth century and especially during the past fifty years: namely, the change in naturalism; the growing experimentalism; the new realism; and the social democracy. And as a preliminary to this study, let us first review briefly the growth and philosophical development of science during the same period.

[1] Even gravitational astronomy itself may yet be based on postulates that are not deducible from mechanics but from a new science, the science of the ether.

For further study read:

Hadley, A. T., Some Influences in Modern Philosophical Thought, 1913.

For more extensive study read:

Merz, J. T., History of European Thought in the Nineteenth Century, 1904–14;

Perry, R. B., Present Philosophical Tendencies, 1912;

Stein, L., Philosophische Strömungen der Gegenwart, 1908.

2. The scientific achievement of the nineteenth century.—The growth of modern science is comparable to the growth of a farm to which field after field has been added at different times and on which the methods of cultivation have everywhere tended to pass from those of extensive to those of intensive farming. In the seventeenth century certain fields were added to the few cultivated in the earlier centuries and their cultivation reached a truly scientific standard of excellence. These fields were especially astronomy, mathematics, mechanics and physiology. The eighteenth century witnessed a more intensive cultivation of these fields and the addition especially of chemistry, geology, zoölogy and botany as new fields of scientific labor. The nineteenth century witnessed vast achievement in the older fields, the raising of the cultivation of the later fields to a thoroughly scientific level, and the broadening out of the whole domain of science until it included the all but innumerable fields of present research.

During the nineteenth century the older fields of science have themselves become vast domains. Mathematics has expanded far beyond what a man can master in a lifetime. Physical science has come to include the vast fields of electricity, magnetism, light and heat. The older fields of gravitational and observational astronomy have been greatly enlarged through the discoveries made possible by far better instruments and methods, and to gravi-

tational astronomy has been added the field of physical astronomy. The small and struggling science of chemistry of the eighteenth century has become the enormous enterprise and field of present chemical research. Geology and mineralogy were added to the other sciences hardly before the end of the eighteenth century and they have since become extensive domains of investigation. The already large fields of eighteenth century zoölogy and botany have been added to not only by further exploring within the older territory of morphology but also by annexing the new fields of embryology, phylogeny, protozoölogy and protobotany. But the older fields of science have not only become vast domains, they have also passed from the stages of pre-experimental, or the early stage of experimental cultivation, to that of the elaborately and rigorously experimental.

Not only have the older fields of science become widely extended during the nineteenth century but new fields have been added to science. These new fields are in general those of man and society, and of the history of all that makes up human culture. True, many of these fields such as psychology, politics and history were long before fields of study and thought; but they were never before truly fields of that systematic, organized and genuinely inductive research attained by modern science. In the first half of the century in Germany and as part of the romantic movement came, as we have seen, the beginning of that mighty movement which so characterizes the present time, namely, historical research. The field of this movement at first included besides political, or general history, especially the history of language, of art, of thought and of Christianity; but since that time it has come to include the evolutionary study of virtually every aspect or part of man's life. In anthropology, psychology and allied subjects man and his mind have come to be

studied elaborately and systematically. In social and political science, and in economics the older more or less speculative and rationalistic writings of thoughtful but isolated men have tended to become the more and more co-operative, inductive and systematic research of a body of scientists. However, this transformation of history, anthropology, psychology, social, political and economic science from rationalistic sciences into genuinely experimental, inductive and organized forms of research is relatively recent and is by no means complete. Still, that it is taking place is one of the most significant facts in the philosophical development of our time.

This mere skeleton outline of the scientific achievement of the past one hundred years, inadequate as it necessarily is, is surely enough to make us perceive at least the vastness of the growth of science during the recent decades of European history. Nothing in the entire history of science is comparable to it in mere vastness and it makes our age in this respect unique in the history of man. It has made us scientific in place after place where our forefathers were prescientific and even primitive. It has substituted skill and insight in countless situations of life where our ancestors could respond only instinctively, blindly, or emotionally.[1] Not only has this vast growth of science transformed completely the world we understand but it has also had two immense economic and political consequences, a direct one, the enormous increase in wealth and population and the marked shortening of the distance between place and place and, an indirect one, the greater socialization within the nations and within the international world. It has made man more independent of

[1] Consider but one prominent example, the winning of a knowledge and control of infectious and contagious diseases and the outgrowing of the hit and miss medical practice of our forefathers but a few generations ago.

his natural environment than ever before, and it has given him a self-confidence to undertake and to control what in the ancient world belonged only to the gods to execute and to administer. Nonetheless, increased knowledge has brought an increased realization of ignorance and a corresponding caution and modesty. A distinctly humbler intellectualism and sense of power has superseded the confidence exhibited by our fathers in the heyday of early scientific achievement. In other words, the distinctly adolescent self-confidence exhibited in the intellectual life of the seventeenth and eighteenth centuries has given place to a caution and a reserve in the intellectual life of the great thinker of to-day which in contrast seems to mark manhood.

For further and for more extensive study read:

(*For mathematics*) Merz, History of European Thought in the Nineteenth Century, chapter XIII;

Russell, B., Recent Work on the Principles of Mathematics, in International Monthly, 1901, *4*.

(*For astronomy*) Berry, Short History of Astronomy, 323–409.

(*For physics*) Merz, *ibid.*, chapters VI and VII;

Cajori, History of Physics, 137–305;

Whetham, W. C. D., The Recent Development of Physical Science, 1909.

(*For chemistry*) Tilden, W. A., Short History of the Progress of Scientific Chemistry in Our Times, 1899;

Thorpe, T. E., History of Chemistry, 1909–10;

Meyers, E. S. C., History of Chemistry, 1906.

(*For geology*) von Zittel, K. A. (transl. Ogilvie-Gordon), History of Geology and Palæontology, 1901.

(*For biology*) Darwin and Modern Science, 1909;

Merz, *ibid.*, chapters IX and X.

(*For psychology*) Merz, *ibid.*, chapter XI.

(*For social and economic science*) Robinson, J. H., The New History, especially chapter III;

Sociological Papers, 1905, The Macmillan Co.;
Ingram, J. K., History of Political Economy, 2d ed., 1907.
(*For anthropology*) Haddon, A. C., History of Anthropology, 1910.

3. The great discoveries of marked philosophical importance.—The science of mathematics has grown not only in extent but also philosophically by an amount that makes the mathematical achievement of the nineteenth century comparable to that of the golden age of Greece. Beginning with the labors of Gauss (*fl.* 1820) and Cauchy (*fl.* 1830) the science has become more truly deductive and more thoroughly organized, its fundamental notions have been rigorously defined and its fundamental assumptions have become more and more explicit. The general tendency has been to unify mathematics. The most important and fundamental notions of the science, many of them used from the days of Greek mathematics, have for the first time in history been rigorously defined. Prominent among these notions are those of number, infinity, order, continuity, and the fundamental operations of algebra and the fundamental notions, assumptions and transformations of geometry. Besides making the science more genuinely rigorous, deductive and simple the philosophical mathematician has come to a clearer apprehension of the nature of his science. This has led to one of the most important philosophical discoveries in the intellectual history of man, to the discovery that pure mathematics is a non-existential science. Ancient thought and modern thought in the seventeenth and eighteenth centuries naturally led to rationalism because the thinker believed that he had in mathematics an infallible and *a priori* theory of reality;[1] for mathematics seemed an instance of the mind

[1] Of such rationalism the theory of Kant is a prominent example. Convinced that mathematics is not an experimental science but a science that the mind achieves by its own intuition and convinced

by pure reflection and independent of observation and experiment discovering what reality *has* to be.

In physical science also, besides great increase in information, there has been great progress philosophically. The sciences of light, heat, electricity and magnetism, so largely the achievement of the nineteenth century, have completely transformed our insight into the nature of the world of matter and energy. Physical research has added to our universe a world, the world of the ether and its undulations; it has broadened our conception of energy

that mathematics is not only infallible but also true of the existent world of our experience, Kant inferred the following remarkable rationalistic theory of reality. All the mathematical aspects of the world are the product of the mind and literally depend upon the mind for their existence. Thus space and time and all those aspects of the material world which exemplify the principles of the Newtonian mechanics are fundamental mind-given aspects, or forms of experience. That is to say, the world is a spatial, temporal, material and mechanical world because of the nature of the mind and not independently of the mind. These forms of our intuition and understanding make our world the sort of world it is and therefore if our mind had other forms the world would be mathematically different or even non-mathematical. Such a theory seemed thoroughly sound in 1781 and for decades afterward and seemed so to many of the greatest intellects. To-day it does not seem sound to the mathematician, for mathematics is not an existential science. A world of different geometrical characteristics from those we believe to be possessed by the existent world is mathematically possible. The real world is thought of by us to be geometrically Euclidean and three dimensional; but a non-Euclidean world or an n-dimensional world would as truly exemplify mathematical theory. In other words, mathematics makes no assertions whatever regarding what exists or what does not, but asserts merely the consequences of certain hypotheses, it may be at one time the consequences of one hypothesis and at another time the consequences of the contradictory hypothesis, leaving the question quite open which of these hypotheses is true of the existing world or even if either is true of this world. In short, one of the greatest bulwarks of rationalistic theories of reality has been destroyed by this remarkable philosophical discovery within mathematics.

and has reformulated the older principle of the conservation of motion into the principle of the conservation of energy; and it has raised a philosophical difficulty of profound theoretical importance, the irreversibility of nature's processes.

During the last two decades, discoveries have been made of even greater assistance to an insight into the nature of the physical world. Indeed, it has been said that during these few years man has learned more regarding the nature of matter than he had in all the past of his history. I refer, of course, to the discoveries resulting from investigating radioactivity. The electron hypothesis promises to bridge the gap between the ether and the world of matter and between the world of physics and that of chemistry. Some day it may even make the chemical elements and their properties deducible from the logically prior physical science. Before these discoveries the universe of mechanics and the universe of chemistry were so distant that the gap between them formed a serious philosophical embarrassment. Of course, the belief was entertained that some day mechanics might account for the chemical, but there was little to justify the belief. Now, however, we may reasonably hope that science will in time find all the bridges necessary to pass from the ethereal disturbances, light, heat, electricity and magnetism without logical break to chemistry. If this hope is in fact realized, it will be one of the greatest philosophical triumphs, if not the greatest philosophical triumph of the intellect of man.

Within chemistry itself have been made many discoveries of great philosophical importance; [1] but it is quite

[1] Prominent among these discoveries that tend to make chemistry deductive are the great advances in physical chemistry, *e. g.*, the theory of gases and of solution, of osmosis and of ionization, the discoveries that collectively make up stereo-chemistry and such dis-

beyond the scope of this chapter even to summarize them. If we mean by the philosophical progress of a science its movement toward being a purely deductive science, then chemistry has made marked philosophical progress during the nineteenth century and especially during the past sixty years, far as it still is from being actually a deductive science.

The progress in biochemistry has been peculiarly of philosophical importance because the chasm between the inorganic and the living is wide and unbridged. However, the bridge is certainly under construction whether or not it will ever be completed. From both sides of the chasm the scientists of the past fifty years have been approaching one another. On the one side, physical and organic chemists have little by little learned to do in their laboratories a few of the things that the living cells of animals and plants do. True, they do these things usually by different methods, but the methods used by the living are in part understood. For example, the discovery of osmosis and the presence and function of enzymes uncover many old mysteries. On the other side, the physiologist is becoming more and more of a chemist, and he is becoming one because he is finding more and more chemistry in the doings of living cells and because chemistry is helping him explain many of the facts he encounters. For example, the characteristic phenomena of the living cell and of its division, the action of toxins, the secretion of glands and the effects of internal secretions and the interaction of cells in the multicellular organism are noticeably becoming more and more physico-chemical problems. All of which does not prove that the bridge between chemistry and physiology will ever be completed, but it does indicate the marked progress of bio-chemical research toward this end during the recent decades.

coveries as the periodic law of Mendeléeff, valency, and the methods of building up synthetically organic compounds.

Moreover, another important bridge is building between the living cell and the simplest organic compounds. We may call it an evolutionary bridge. The vast distance in terms of evolution between a bacterium and a relatively simple organic molecule was not fully appreciated a few decades ago. In recent decades, however, the study of the cell has made the scientist perceive what an extremely complex chemical-physical machine it must be and what an enormous distance had to be traversed by evolution in passing from inorganic matter to a bacterium, a longer distance probably than from the unicellular organisms to man. Evidently if there has been such an evolution it is a matter of prime philosophical importance to verify this and to discover intervening links in the evolutionary chain. Two centuries ago the discovery of the unicellular organisms themselves was a discovery of precisely such an important link between the familiar animals and plants and the lifeless world, a discovery that may without exaggerating be called the discovery of a world, the vast world of primitive life. In these days the organic chemist is discovering another such vast world, this world lying between the living cell and the simpler organic molecules. Perhaps it may be called the land of molecular chains. That is to say, in such a discovery as that of the colloids biochemistry and organic chemistry are literally discovering a world with an enormous population but a world heretofore completely hidden from our view as the world of primitive life was hidden before the microscope. If only we can come to know this world well, the evolutionary gap between the living cell and the simple organic molecule may indeed be bridged by a chain of intervening forms, and thus another serious philosophical embarrassment may be forever removed.

Within general physiology also there has been decided philosophical progress even since the days of Darwin.

As one biologist has expressed this advance, "Darwin seems almost as far away as does Democritus." Physiology has been shifting from a science of the gross organism to a science of the processes within and about the living cells. Thus in these latter decades the discovery of the cellular structure of the living organism made early in the nineteenth century has become for biology what Dalton's doctrine of atomism has long been for chemistry. That discovery predestined the science to become an *atomic theory*, and this it has since literally become. Moreover, the very doctrine of the evolution of the forms of life has become a problem of the evolution of atomic entities; for the study of the mechanics of heredity has opened to our view another atomism in the Mendelian and other factors present in the germ-plasm which determine the adult or mature form. Thus to-day the evolutionary problem has been shifted from the problem of the origin of the adult forms to the problem of the origin of the germ-plasm these adult forms carry, and of the origin of the heredity factors this germ-plasm contains.

The study of behavior, or of mental life also has made great philosophical strides forward. Not only has this study become experimental and genuinely inductive; but discoveries have been made of truly philosophical importance. The science has tended to expand into a general science of behavior and not to remain merely a science of the human mind; that is to say, the science of the human mind is not *sui generis* but is an arbitrary section of the general science of behavior. On the one hand, the same general evolutionary continuity is being discovered between the behavior of the simpler organism and the behavior of man as Darwin discovered in their morphology. On the other hand, the same general approach toward an atomic theory is evident in psychology as in physiology. The conduct of the more complex organisms

is in part built out of the conduct of the less complex organisms of the same evolutionary line; and the chief addition besides new atoms of behavior is the further organization of these older atomic forms of behavior into more complex or more highly integrated systems. For example, already in the behavior of the common garden worm is to be seen the prophecy of behavior as complex as that of man.

Finally, we come to the science of man and society and to the science of the origin of man's customs, tools, arts and institutions. Here likewise the same story is to be told of important philosophical discoveries during the past fifty years. The discovery of the customs, tools and arts of primitive man is making ever clearer the evolution of human civilization. The study of primitive societies is doing a similar work for the historian of society. Again, man, the atom of social evolution, is better understood; and hence it is possible to explain more of human history than ever before. The gap between man and his anthropoidal ancestor is being bridged by the discovery of intervening types of men and intervening types of culture. In general, this extensive field of research exhibits the same philosophical approach, as do the biological sciences, toward atomism and evolutionary continuity.

For further and for more extensive study read:

(*For mathematics*), Young, J. W., Lectures on the Fundamental Concepts of Algebra and Geometry, 1911.

(*For physical science*) Höffding, History of Modern Philosophy, Vol. II, 493–498;

Mach, E. (transl. McCormack), Popular Scientific Lectures, 137–185;

Nunn, T. P., Animism and the Doctrine of Energy, Proc. of Aristotelian Soc. N. S. *12*, 1912;

Duncan, R. K., The New Knowledge, 1910;

Whetham, Recent Development of Physical Science.

(*For biochemistry*) Moore, Origin and Nature of Life (Home University Library);
Noel Paton, D., A Physiologist's View of Life and Mind, Hibbert Journal, 1915, *13*.
(*For physiology*) Darwin and Modern Science, 1909.
(*For psychology*) Watson, J. B., Behavior, An Introduction to Comparative Psychology, 1914.
(*For anthropology*) Marett, R. R., Anthropology (Home University Library).

4. Naturalism.—The two preceding sections have briefly indicated the remarkable triumph of naturalism in the past one hundred years. If the thinkers of the seventeenth and eighteenth centuries were justified in setting aside magic and animism as inadequate hypotheses, certainly the thinker of to-day has a thousand times as much evidence to justify him in so doing. But intellectual history is not a mere growth in the amount of evidence collected for or against this or that hypothesis. New information often reveals the hidden complexity of the old problem, unseen when the problem was first raised; and therefore its effect is often to lessen confidence. However, naturalism has grown greatly in strength and in the number of its disciples. The intellectual classes and the general public have never before been as naturalistic as they are to-day. In the main the bitter controversies against naturalistic science are over and naturalism has won the fight. From star dust to man and society, from celestial mechanics to psychology and sociology our sciences study the problems raised in a naturalistic way and in this way as a matter of course. Some of the great gaps in the evidence justifying the naturalistic conception of the world are now at least partly filled. Such gaps we have seen to be the gap between the prechemical matter and the chemical elements and molecules, the gap between the world of inorganic chemistry and the world of living

organisms, the gap between unicellular life and man, and the gaps between the rude culture and society of the prehistoric man and the religion, art, science, industry, government, language, and in general the civilization of the present European peoples. Thus the evolutionary hypothesis so essential to naturalism is firmly fixed in our intellectual habits. Again, the possibility of science explaining deductively the complex out of the relatively simple, the chemical out of the prechemical, the vital out of the chemical, the mental out of the vital, and the social out of the mental, seems more than ever justified as an hypothesis and as a plan and ideal goal of research. Indeed, never have supernatural and animistic hypotheses been less in evidence than they are in the contemporary treatises of science or in the discussions of the learned world.

Yet at the same time the older mechanistic naturalism of the seventeenth and eighteenth centuries seems to thoughtful men to-day altogether too simple. This older naturalism was based solely, as we have seen, upon the gravitational astronomy and the mathematical science of mechanics, which implies that it was based upon but a very small part of modern science as it now obtains. Hence, if we are to-day naturalists, we are naturalists facing a world indefinitely more complex than the one apprehended by the scientist of one hundred and fifty years ago, we are naturalists far from being convinced that the Newtonian mechanics is to be in the long run the fundamental physical science, we are naturalists far from being confident that the profound gaps between the various strata of reality can ever be bridged *completely*, and we are naturalists who are skeptical in our present ignorance toward all attempts to deduce the nature of reality by taking the results of one science and making them the premises of a universal science.

This skepticism can be best illustrated by the actual

revival in our time of vitalism and animism. To some thinkers the gap between the physical-chemical world and that of life and the gap between the physiological and the mental seem quite unbridgeable. In short, vitalism and animism have reappeared in the scientific world itself. That is to say, life and mind are thought by some scientists to be radically distinct respectively from the chemical and from the physiological; for remarkable as are admitted to be the triumphs of biochemistry and neural physiology, these achievements do not explain the facts that are peculiarly vital or mental. According to the vitalist, life has an irreducible teleological property which chemistry in no way explains; for life adapts itself to the future and in this sense exhibits purpose, whereas chemistry is as unable to explain purpose as it is to judge of the beauty of a painting. According to the animist, the higher types of mind exhibit memory and personality which make any atomic theory whatsoever inadequate, and therefore they cannot be explained by discovering the way in which neurons are organized, or integrated. Hence these thinkers maintain that to explain life and mind we must assume a vital principle or entity over and above the chemical molecules and their compounds and a soul over and above the mental as explained by the laws of inborn and acquired neural connections. These thinkers, the neo-vitalists and the neo-animists, though many in number remain relatively a small party. In general, the scientific world seems disposed to keep to its naturalistic working hypotheses and naturalistic spirit of research.[1]

[1] Besides the neo-vitalists and the neo-animists, there is a third group of physiologists who doubt the ability of science to discover complete logical continuity between the relatively simple and the relatively complex strata of reality. They maintain that there is danger in trying to simplify the complex and to deal with the concrete in terms of high abstractions. The complex and the concrete are the real; and the abstract sciences such as physics and chemistry

For more extensive study read:

Driesch, H. (transl. Ogden), History and Theory of Vitalism, 1914;

Haldane, J. S., Mechanism, Life and Personality, 1914;

Moore, Origin and Nature of Life (Home University Library);

McDougall, W., Body and Mind.

5. Rationalism and experimentalism.—During the past fifty years the trend away from rationalism and toward experimentalism has been marked. Though rationalism is still frequently to be found, remarkably little remains of the confidence, so prominent in the thinkers of the seventeenth and eighteenth centuries, that mere thought can discover and verify vast existential hypotheses and that man's mind has in it the powers to elaborate independently of experience either what does exist or what should exist. In the intervening period thoughtful men have seen such theories end so often in failure, and have learned so much better the nature of human discovery that they expect mere reasoning to be usually in the wrong. They have seen the simple problems of speculation prove so often to be the extremely complex problems of fact, and they have beheld the few problems of an earlier stage of a science develop into the numerous problems of a later stage; that they are well aware that the work of science is never done and therefore they expect their conclusions and hypotheses to be soon outgrown through the work of the next generation of investigators.

are inadequate to deal with the *total nature* of the real, for no matter how successful these sciences are, they always leave a *residue unexplained*, or they belie by their very simplicity the richness of the real. However, this protest against oversimplification on the part of science does not mean that these thinkers in any way question the results of science or are hostile to the naturalistic program of research. Rather, it means, that they believe physical science *as a world conception* to be inadequate.

To be ignorant is one thing but to be aware of that ignorance, to be conscious that theories are tentative, to admit that experiment must take the place of mere deduction, these are different things. To hold therefore to theories loosely, to expect to see them outgrown, to be conscious how utterly unverified our fondest deductions often remain, to see that we have got them in the only way available in our ignorance but in a way that makes them doubtful, and to strive to substitute for mere logic the appeal to facts, to exhibit such traits is to give evidence of a new philosophy, is to outgrow rationalism and to become experimentalists. This change of spirit is evident throughout the length and breadth of science and indeed of the intellectual life of our time. It has come slowly for it was exhibited as a genuine philosophic trait in Galilei long ago but now it has made its way until it can be truly called an important part of the spirit of the age. In contrast, think of the *isms* and the *ologies* of the past two hundred years, in science, in religion and morals, in politics and economic policy, in dealing with the criminal and the pauper, in educating children, and in caring for the sick!

6. Intellectualism and pragmatism.—The pendulum that we see thus swinging can swing even farther, as recent philosophic thought proves. Science must become not merely experimental but also practical. By science being practical two doctrines are implied. First, the entire intellectual career of man is merely a part of his life and shares with his other behavior its general biological character, which is adjustment to internal and environmental conditions. That is to say, when we know, we are behaving as truly as when we eat, we are as organisms adjusting our responses to conditions and fulfilling life's needs. The man seeking his escape from a forest is as truly an organism responding to a biological need as is a hungry man eating. The child in school endeavoring to work out its

arithmetical problems is an organism face to face with an environmental embarrassment that it must meet and to which it as an organism has certain instinctive and acquired ways of responding, precisely as is a cat caught in a trap. In short, man in his entire intellectual enterprise, be the particular task in the chemical laboratory, the mathematician's study, the counting room, or the carpenter shop, is likewise but responding as an organism to the needs and environmental conditions which form the total situation of the moment. If then the work of the intellect is response as truly as is the work of the arms or legs, it follows that science cannot be correctly understood and interpreted until we regard it as a form of human response. In other words, science is not understood, if we regard it, as did the older philosophers, as an ideal contemplation of a passing panorama, or as the discovery of a real world unrelated to man's biological nature and made an object of study by a curiosity that is biologically superhuman. Rather science is of the earth, earthy; it is the product of human toil; and its authorship is as human as is that of a coat or a house. Therefore divorced from human life and studied *in abstracto* it is nothing whatever, nothing more than the grin of Alice's Cheshire cat with the cat gone.

Moreover, consider the notion of reality of the intellectualistic philosopher; for this too is the abiding grin of the absent cat. Reality is for man a biological notion. It means nothing unless expressed in terms of human behavior. It means conditions man must meet to live and thrive, it means instruments man must use to gain his ends, it means the world of human ambition, the world responded to ultimately by the instinctive nature of man. Man has no more a naked curiosity or a universal curiosity than has a spider an instinct to weave all possible types of webs, or to weave webs merely for the sake of giving

entomologists something to study. The real world for man is human in the same sense as man's bill of fare is human or man's way of walking is human. Superhuman reality is an empty abstraction. For example, if man never had a disease, a broken bone or an abnormal growth, what would the science of medicine be, how would such a science have ever arisen, by what possible means could there be either a debate about or a test of medical theory? It would all be as meaningless as a drama written to play before the walls of the house as the audience, or as a machine invented to do nothing in particular.

Therefore, let the experimentalist not only reject rationalism but let him also reject intellectualism. Let him humanize science, see in it man's trial and error and instinctive responses. Let him define truth and reality in terms of the practical, in terms of the successful response, in terms of man's life and interests, and mean by the universe the field of human response and interest. Let him see in the scientist precisely what he has long ago seen in the inventor of machines, the student of medicine, the writer of dramas, the builder of houses, the farmer and the laborer.

Second, "science being practical" implies that man should avoid abstract science divorced from concrete problems. That is to say, if knowing is a response; it is a response to *a present concrete situation*, the solution of *actual* human problems as man faces those problems. It is nothing else by right. If made anything else by dreamers, rationalists and intellectualists, it is as vain an enterprise as the search for the fountain of perpetual youth or the search for the holy grail. Man does not, as a biological entity, face abstract situations or situations in general; he faces always concrete and present situations. For example, the physician is not called upon to cure typhoid fever but *this man* sick with typhoid fever; therefore unless his

science teaches him to meet this real situation and not some imaginary general and abstract situation it is a mere delusion. In general, all disputes or all problems that we have the bad habit of divorcing from the forms in which they are met in concrete situations, should be promptly returned to their concrete setting before further discussion or further research. Be a concrete chemist, or a concrete mathematician, or a concrete physician. The habit of wandering into pure theory divorced from the concrete is an intellectual vice. Consider, as an example, the fine old debates regarding the freedom of man's will and in particular regarding what a donkey would do midway between two bundles of hay. How utterly idle! You and I meet human responsibility not in the abstract but in the concrete. Our actual problems are, what to do with this insane man, with this drunkard, with this feeble-minded child, with this ambitious and intellectual boy. Let the man who wishes to argue with you whether or not the human will is free, state actual concrete instances of human conduct and state precisely what he would mean in the given instances by acts of free will and then if necessary try the experiment of watching the actual cases.

Pragmatism, as this reaction against intellectualism is called, is a distinct and growing element in the philosophic thought of the past fifty years and is a natural companion of experimentalism. During this time it has made its presence felt in almost every department of western intellectual life. In art and literature it makes its presence evident in a rebellion against any fixed principles such as formalism and in the general artistic doctrine that the individual should throw off the authority of tradition and frankly put in the place of this authority his own likes and dislikes. That is to say, there are no universal principles of the artistic and the beautiful, but rather there are the concrete tastes of the individuals that make up the in-

terested public. For example, take the novel. There are no principles by which the ideal novel can be defined for all time. Rather what we find is that the taste of one day differs from the taste of another and that the least expected taste often becomes the prevailing criterion.[1]

In science pragmatism is more nearly explicit. In such prominent contemporary men of science as Ernst Mach, Ostwald, Poincaré, Karl Pearson and many others we find the belief asserted that science has been largely conventional and accidental in its use or selection of fundamental notions and postulates. So-called laws of nature or so-called necessary principles are no more such than a locomotive is a law of nature or an intellectually necessary instrument of hauling. Such laws and principles survive for much the same reasons that the locomotive survives, or the English language survives; that is, because they fill a certain office more satisfactorily than does any rival instrument or invention. *In abstracto* they have no importance or validity whatsoever. What importance they have, is derived from the fact that they solve our problems or do so more conveniently than do rival devices. The only matter of ultimate importance is the concrete problem actually facing the human intellect together with the need, desire or curiosity impelling man to eliminate the problem by solving it in the psychologically easiest way. The resulting solution satisfies the immediate need and therefore passes for the present; but another generation may become dissatisfied with the solution and seek

[1] The intellectualist may define the true goal of the novel: First comes the plot that tells a story that is impossible, then one that tells the improbable and next one that tells a story that is probable and finally as the ultimate of plot development comes the novel which tells the inevitable. But in the midst of this development comes a Robert Louis Stevenson with his romantic and improbable tales, wins the world's approval and defies successfully the rules laid down by the intellectualistic literary critic.

a new one. Thus science is ever changing her solutions, her fundamental notions and postulates to suit the immediate and therefore temporary need. The entire system of scientific theory is relative to the practical exigencies of the hour and never attains some absolute or fixed goal called by the intellectualist *the truth.*

Other places in which pragmatism is nowadays especially noticeable are in moral theory, jurisprudence, politics, and educational theory. Probably no age has had less definitely an explicit moral code than our own, or less confidence in the finality of such a code; and yet we are morally superior, there are good reasons to believe, to any preceding age in such general traits as humaneness, socialization, antagonism to privilege, and self-restraint. In other words, our morality seems to be less a general theory and more an array of solutions of concrete moral problems. The same is true, if I mistake not, of our political life and practice. Party politics are remarkably deficient in abstract principles and correspondingly rich in platforms offering solutions of special pressing social and political problems. So much so is this the case that the strict party man is often puzzled what principle his party does stand for. For example, the liberal party of England is remarkably different from the same party fifty years ago, moving from its old individualism toward socialism, as Mr. Hobhouse explains in his book on Liberalism, under the pressure of concrete special political and social problems. How utterly naïve Herbert Spencer seems to-day to the English liberal! Furthermore in both moral and political theory aside from general practice pragmatism is showing itself even more openly. There is a distinct distrust of "the simple solution of complex problems." Even socialistic literature is becoming more lenient in its demands for all or none; and is distinctly less utopian. The motto "sufficient unto the day is the

evil thereof" implicit in this branch of theory indicates, if I mistake not, a growing sense of the immense complexity of human life and a corresponding distrust of general theory; it seems to brand moral codes and general political theories as absurdly naïve. In jurisprudence there is again, if I am not misled, a growing restlessness toward the intellectualistic system of the traditional law. On the one hand is a manufacture of statutes too fast for the jurist to keep up the pace, with a hidden but probably rapid change of legal principle. On the other hand, is a restlessness against the academic legal tradition and against the academic jurist evident not merely among the public but in the law schools. There is movement away from what is left of the doctrine of the natural rights of man and toward the doctrine that society has to solve as best it can the concrete legal problems which it actually faces; and there seems to be a growing sense that the true maker of legal history is and always has been the practical need of the time, that law is not some universally valid system alike for all ages, climes and nations, but that it is the outcome of the struggle in each environment to meet the pressing practical problem forced upon society. Finally, in education a marked rebellion is evident against the merely academic curriculum. Learning for its own sake is disappearing. Learning for the sake of the particular station in life the pupil is to occupy and teaching so that what is taught may be used, are distinctly characteristic of the great changes brought to pass in the schools of Europe and America in recent decades. Consider the developing and multiplying of technical schools, the struggle against the older traditional classical and philosophical curriculum and the entrance of utilitarian subjects into most curricula. Even in religion, less is thought to-day than ever before in modern times about abstract theology and differences in creed and more is thought about con-

crete piety, concrete holiness and individual consecration to noble causes. If I mistake not, never before in the history of man have thoughtful men been the pragmatists they are to-day and never before have they held pragmatism as a genuinely explicit philosophy to the degree they do in our times.

For further study read:

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7. The new realism.—To the question: To what extent is recent and present philosophic thought subjectivistic? no precise answer can be given. However, it can be said that most thoughtful men are Cartesian dualists. If as such they face squarely the problem of phenomenalism they divide into three groups: first, those who with Descartes believe that science can infer the nature of the physical, or non-mental world; second, the agnostic phenomenalists who believe that science can tell us nothing about a

world beyond the world actually perceived by our senses; and third, the idealists who have so far outgrown their Cartesianism as to deny the existence of a world transcending experience and who therefore deny dualism and the cogency of its phenomenalistic problem. The first of these groups which we may call Cartesian phenomenalists, is not only by far the largest but the most truly representative group among philosophical men of science. The second of these groups has many members and, among these, thinkers whose names are known the intellectual world over. The third group which includes the followers of Berkeley, the so-called subjective idealists, and the followers of the early German idealists, the so-called objective idealists, is the smallest of these groups of Cartesians, but has among its members also men recognized as great contemporary thinkers. Finally, besides these three groups of Cartesians there is a still smaller group of thinkers who believe that we must go back beyond Descartes and beyond the Greeks and study again the whole problem of the mental and of the relation of the knowing mind to its object. These thinkers are called neo-realists.[1]

At least two lines of argument are followed in the thought of these realists in their protest against the traditional way of conceiving the mental. First, Cartesian dualism has been thought through during the past three hundred years and has been shown to end in absurdity. Second, this ancient dualism and its conception of the mental has come to the modern thinker from the ancient world and

[1] The movement is so young and so untried by the test of history that I hesitate to give it a place in a brief and general account of contemporary philosophic thought. However, since the problem is philosophically so important and the difficulties of Cartesianism are so keenly felt, and since the very foundations of one of the most important general sciences, namely psychology, are in question, the issue deserves a place even in our brief account of contemporary thought.

is not based upon an open-minded study of the facts in the light of modern science. This older conception of the mental presupposes the notions of substance and cause as these notions were used in Greek thought; whereas modern science has been outgrowing both notions. Therefore, if a new way of conceiving the mental is to be thought out on the basis of modern science, it must be done in terms of the fundamental notions of modern as opposed to ancient science. Let us examine in order each of these lines of argument.

The neo-realist believes that Cartesian dualism and its resulting subjectivism have been tried by history and have been reduced to absurdity. In the first place, dualism leads directly either to the absurdity of agnosticism or to the absurdity of parallelism. If you grant the dualism of the typical Cartesian, some of the keenest thinkers of the past two hundred years show you that the non-mental world and the world of our experience, the world of sensation, are separated by an impassable gulf. The objects that we can observe are by hypothesis mental and the mind is quite without any logical or scientific postulate that will enable us to deduce from these mental contents a world which by hypothesis quite transcends these contents. Thus you are left with the doctrine that you can know the world of possible experience but that the other world, the non-mental world postulated in your original hypothesis, is completely unknowable. The realist asks: How can you then fail to suspect the original hypothesis? But, let us assume with other Cartesians that the world of mind and matter are knowable. Then we have also a verdict rendered by some of the keenest thinkers of the past three hundred years, a verdict which decides that the two worlds, the world of mind and the world of matter, cannot interact. Matter can act only upon matter, for energy in its transformation must remain energy. That is,

the world of physical science is a closed system from which energy cannot depart and to which energy cannot be added. For such thinkers the mental becomes a mere epiphenomenon or a parallel but non-interacting aspect of some unknown substance, thing or system of which the physical is the other aspect. If you then start with Descartes you presuppose a world of minds and material particles all interacting; but if you stay a Cartesian and think the matter through, you end believing in two non-interacting worlds, or systems. The neo-realist accordingly asks: Does not this parallelism seem the *reductio ad absurdum* of the initial Cartesian assumptions? Does it not indicate the need of investigating anew and without any traditional bias the very notion of the mental inherited by modern science?

In the second place, the one remaining way of escape for the Cartesian which history records, namely, idealism, has also been tried and found wanting. With Berkeley or with Hegel you can admit the inadequacy of Cartesian dualism and become a Cartesian monist by showing that the world of experience conceived still as a mental world is the only world that exists. In other words, starting with the Cartesian notion of the mental you can show that only the mental exists. Against the idealist the realist brings two charges. First, the idealist has had one hundred years and more in which to win the scientific world and has failed to convert this world. Of course, this failure may be due not to the inadequacy of idealism but to the philosophical obtuseness of even the intellectual! Second, the idealist brings us back to the world from which all Cartesians start. He moves in a circle. If all is mind, there is a mental-material world and a mental-mental world. That is to say, physics and chemistry, the idealist is careful to tell us, remain as legitimate sciences. And what do they study? Of course the physical world.

Hence the mental world, the only real world, includes two worlds, the same as ever, the mental and the material worlds of common sense and of science. We have still on our hands then all the old problems that idealism claimed to solve. We have still to decide how to define and to distinguish the mental and the physical, how to account for their interaction, and how to explain that the mind can know such a disparate system as the physical. As far as psychology is concerned are we not precisely where we started, back with Descartes?

Let us next follow the second line of realistic argument. Science, since Galilei, has been outgrowing the notion *cause* and has been substituting for it the mathematical notion *function*. Consider the following simple illustrations of what the mathematician means by a function. The length of the circumference of a circle is a function of the radius; for, as the radius is more or less in length, so stage for stage (or in one to one correspondence) is the circumference. The amount of pressure that has to be exerted upon a lever is a function of the position of the fulcrum. The distance the water from a garden hose will carry is a function of the angle at which the nozzle is held. What then does the mathematician mean by function? Merely that there are two series, and that for each value or stage in the one there is a corresponding value or stage in the other. For each radius there is a corresponding circle. Or given one value you always get another or corresponding value or given one magnitude you always get a corresponding magnitude. In short, a function is but a mathematical way of describing a certain relation between the entities that vary in one to one correspondence. To come at once to the point, as modern science advances, this notion of the functional relation is superseding altogether the ancient and even pre-historic notion of cause. The notion of cause is probably due to our

kinesthetic feelings such as we have when we push, pull, twist and bend. We feel ourselves as doers, as powers, as causes, or as forces and have peopled nature with these ghosts. We think of dynamite bursting or tearing the rock apart as we tear paper. It is a doer, a cause, a giant in disguise. David Hume analyzed this notion of cause and showed that we do not apprehend any such relation between a cause and its effect. Rather what we apprehend is precisely what the mathematician means by function. A radius does not make the circle or do anything *muscular* to lengthen it. The *position* of a fulcrum or the *size* of a wheel or the *angle* at which the nozzle of a hose is held are each and all agents in this world of ours. If anything does, or causes or forces, they do so; and yet they are lifeless, motionless, non-muscular entities. They are merely geometrical entities, merely mathematical relations. Now, as science advances, the so-called causes resolve themselves into these functional relations, that is, the more we learn about the objects and events of nature the more these relations stand out in relief and the quicker the causes and forces of our barbaric and prehistoric ways of thinking disappear. Nature becomes an indefinitely complex cobweb whose minute threads are, in the mathematical sense of the word, functions.

If then in solving the problem: How do mind and body interact? we no longer conceive them *to be connected as two substances causing changes of state in one another*, we have but to seek the *functional relations holding between the two systems.* These relations can be discovered by experimental research and are not matters to be debated by rationalistic speculation. They are relations *that can be observed* and do not involve hidden substances. *Thus the old problem of the interaction of mind and body disappears altogether.* No doubt research will find that some functional relations do not hold between the mental and the

physical but hold solely between parts of the body as a chemical-physical machine; and this will then prove to be the half-truth hidden in the at present widely held doctrine of non-interaction. On the other hand, other functional relations will be found to hold between the two systems, and this in turn will prove to be the half-truth hidden in the older Cartesian doctrine that mind and body interact. Indeed, the realist believes, *many of these functional relations have already been discovered and already constitute a large part of the results of physiological psychology.*

An objection similar to that made against the notion, cause, can be made against the notion, substance. To ordinary thought there are the many stuffs of which a thing can be composed, such as, wood, stone, iron, water, fat or bone.[1] Moreover, the stuff of which a thing is composed is ordinarily thought to explain its behavior or its so-called properties. It is strong because it is steel, it burns because it is wood. It is powerful because it is dynamite, or he is strong because he is muscular and he is a mighty leader because of his iron will. For rigorous scientific thought all such notions belong in the same group as fairies, ghosts, giants, magic and other creatures of pre-scientific speculation. For science things are what they are, do what they do, have the properties they possess, *because of their structure.* And if we ask what we mean by structure, we are told, *relations between parts,* or *organization.* Thus the solar system behaves as it does or has the properties it has, because of its organization. A smoke ring, a musical note, a locomotive and a vessel filled with gas are each and all simple illustrations of the *nature* of things being no more than their *structure in dis-*

[1] To the Greek thinker all of these seemed reducible to the four elements, earth, air, fire and water. To the thinker of the seventeenth century, they seemed reducible to matter, or to matter and spirit, or to the "ultimate substance."

guise. And this means in turn that science has abandoned or is abandoning the notion of substance and the search for the substance of things.[1]

These two philosophical changes taking place in modern thought [2] are the very principle, if I mistake not, of the new realism, which endeavors to solve the old problem of mind and knowledge by discarding the notions cause and substance inherited by modern thought from the ancient world and by applying the modern scientific notions of structure and function to the facts of mental life as science does to the facts of the physical world.

From prehistoric barbarism man has found in himself a twofold nature, body and soul. The body has its properties and can do its acts because it is one sort of a substance. In contrast, the soul has markedly different properties and does markedly different acts, because the soul is of quite another substance. The paradoxes and absurdities to which this dualism leads have been pointed out. But it can be attacked directly. The human mind is not an ultimate, it is far from being a substance, as a mere matter of fact. *It has a structure* and this structure is gradually being discovered. *It has parts*, for disease can injure some and not others, education can alter some and not others. It differs from man to man and these differences are in part *due to heredity*. In some respects a man can be mentally like his mother, in other respects like his father. Again, the human mind is not an ultimate, for in part

[1] The chemist is aware that his so-called elements are not stuffs in the old sense but are differently organized matter; and the physicist is aware in turn that his matter is not a stuff but either an organization of the ether or another name for certain mathematical values such as mass.

[2] Already clearly present in the attack of Bishop Berkeley against the Cartesian rationalistic mechanical conception of nature and in the positivism of David Hume.

at least it has been explained. In general, this explanation is biological. As our bodies are fitted for our environment, so are our minds. As our bodies are inherited, so are mental traits. As our muscles are fitted to perform certain acts, so have we the impulses, the satisfactions and desires leading to the requisite muscular contractions. Use of any mental trait strengthens that trait. Disuse weakens it. Mental acts leading to satisfaction are more liable to be done again, and mental acts leading to annoyance or pain tend to disappear. In general, the physiology of the nervous system is throwing more and more light upon the working and development and training of the mind. Indeed, the more science learns regarding the mind the more closely related are mind and body turning out to be and the more and more absurd is becoming the older dualism of body and mind.

What then does the realist offer instead of this traditional dualism? The realist urges that the belief in two sorts of stuff, the mental and the physical, be discarded and that we learn to think of both the mental and the physical in terms of relations, structures or organizations having many members in common. For example, the physical chair and the chair I perceive, are in part one and the same entity. We call the chair physical when we assert certain of its relations, its weight, its ability to reflect light, to burn, to resist the pressure of our bodies, and to move through space. We call the chair our mental state when we attend to our behavior and perceive that the chair is a part of the situation to which we are responding. For example, we avoid running into the chair, we give money to purchase the chair, we go to another room in order to get the chair, or though the chair is not at hand we respond to it in a way called talking about the chair. In other words, one and the same entity can be both physical and mental. It is physical in those relations studied

by the physical sciences and it is mental as part of the situation to which we as behaving organisms are responding. Thus the difference between the physical and the mental is a difference *solely of relations* and not a difference of stuff or of entity.[1]

Knowing likewise is a relation, a certain type of response of a living organism, and is not, as the Cartesian pictures it, a reaching out of a mind in one world over into another world beyond a bottomless chasm in order to grasp or apprehend the contents of that world. Knowing is not some transcendent act beyond the reach of science but is as much an event in the world about us as is the blowing wind or the falling stone and as such is as readily studied as any of nature's complex happenings. Entities pass in and out of our field of knowledge precisely as objects pass in or out of the field of things to which an animal is responding, indeed as aforesaid knowing is but a complex type of behaving. The teacher readily ascertains whether or not the child knows its lesson, and does so by putting the child in a certain situation and by then watching the child's response. I learn whether or not I still know my calculus by taking some problems from the old text-

[1] The realist finds many other worlds, or logical systems besides the two of Descartes, *e. g.*, he finds the world of pure mathematics, the world of art and the world of morality. The ultimate stuff, or system of entities to which we come *when we regard things merely as objects of discourse*, is not either matter or mind or any other specific stuff but merely *stuff in general, mere being*. For example, what is red, or what is a noise merely as a possible object of discourse? The answer is not "something physical" or "something mental" but merely "something." This ultimate stuff whose only attribute is "being a possible object of discourse" has been called by the realists "the neutral stuff or the neutral universe." Thus the realist differs from the Cartesian, who finds in every object of discourse "a mental state" or "an experience," by maintaining that such a mere object of discourse is not specifically a member of any system except "mere being," or "mere object of discourse."

book and trying to solve them. This solving is distinctly a set of responses.

The subjective is similarly defined by the realist. A dog's world, that is, the world to which the dog responds, is but a small part of the total universe as the psychologist readily shows, that is to say, the dog's world is but a selection out of the total universe of our discourse, a selection made by the dog's nervous system. So man's world is a selection and science can say many things regarding the sort of selection it is. Man has a human world, and he has such a world in precisely the same sense in which a dog can be said to have a dog's world. No doubt man's ability to know the universe is limited by the character of his nervous system; and therefore man's world and the universe are not to be identified, though what man knows belongs to that universe and much that the dog knows belongs also to our human world. Again man's sensory world is not the whole world any more than is the sensory world of a blind man all of our world. It too is a selection and a very complicated one which science needs to study and to explain and which we to-day understand only in small part. However, we are not entirely ignorant. That our eyes are optical instruments and as such select in part what we are capable of responding to is trite information. That we respond to things in perspective somewhat as the photographic camera does and that this is due to the sort of eyes and nervous system we have, in short, that we select optical projections of a certain sort instead of the entity whose optical projections they are said to be, is also apparent and has its explanation. Finally, that our nervous systems are not perfectly adjusted to the total world to which we need to respond, that our inborn or acquired responses to the world to which we are capable of responding are imperfect, is only too evident. Error is such an imperfect response. In short,

all of these factors make man's world in part a subjective world. That is to say, man's world is subjective in being *a selected world.* It is subjective because man's responses are but *imperfectly adapted* to the world that concerns his welfare.

Finally, man's world is subjective for a third reason, because *the nervous system itself contributes to man's world.* The nervous system is a complex physical-chemical instrument and, precisely as other physical instruments, alters and contributes to the world of which it is a part. For example, mirrors contribute optical projections, prisms contribute spectra, magnets contribute magnetic fields, and whistles and musical strings contribute undulations. So also nervous systems, in ways but little understood, contribute to the totality of existence. Thus the contents of our dreams and of some of our illusions are subjective in the sense that the nervous system is *one of the conditions of their existence.* But this fact does not prevent some of these subjective contents being physical, even as truly physical as is the image in the mirror. However, what they are is *a special problem of science* and *not, as for the Cartesian, a general problem* of philosophy. They are not a mental stuff to be recognized as such by the mere glance of a philosopher. Rather they are like a spectrum to be elaborately investigated by experimental science and to have their nature determined by research.

Thus the neo-realists urge that the nature of the mental be defined in terms of *relations* and *functions* and no longer in terms of *causes* and *stuffs.* They point out that doing so is but to adopt in psychology that general positivism to be seen in mathematical physics and more and more extensively throughout the field of modern science. They claim that by so doing the mental can be sharply distinguished from the physical, the objective from the subjective. Finally, they maintain that the paradoxes of

phenomenalism, idealism, and parallelism can be eliminated and the nature of knowing stated in terms which make knowing, what it undoubtedly is, a proper object of scientific and experimental research.[1]

For further study read:

The New Realism, 1912, 2–42, 303–373, 471–483;
James, W., Essays in Radical Empiricism, 1912, 1–154;
Watson, J. B., Behavior, An Introduction to Comparative Psychology, 1–28.

For more extensive study read:

Holt, E. B., The Concept of Consciousness, 1914;
Spaulding, E. G., The New Rationalism (forthcoming);
The New Realism, 1912;
Mach, E. (transl. Williams and Waterlow), Analysis of Sensations, chapter III.

8. Social democracy.—In the immediately preceding sections we have studied the vast changes recent decades have witnessed taking place in modern scientific thought. In this section we are to study the equally vast changes in the economic, political, social and moral life of the western world during the past one hundred and especially the past fifty years. These changes can be summed up in the phrase, *the rise of social democracy*.[2] That is to say, during the past fifty and more years the western world has become markedly more democratic in its political, social and moral life and has also become markedly more socialized. Both changes can be traced back to movements of the seventeenth and eighteenth centuries, especially to the democratic movement in England during

[1] Part of this section has been taken from an article by the author, "The New Realism," in *The Chronicle*, September, 1916.

[2] In this section I am indebted directly to Professor J. H. Robinson's An Outline of the History of the Intellectual Class in Western Europe, 1915. The field is so vast that this section has to be little more than a list of topics, a syllabus.

these centuries and to the French Revolution. But neither change is the mere outcome of eighteenth century conditions, for the nineteenth century has witnessed the rise of new and powerful environmental factors which have revolutionized the entire economic life of the modern world. Indeed, it is no exaggeration to assert that if we say, "so recent a man as George Washington lived in much the same world as did Aristotle," we may consistently add, "but the man of to-day lives in another universe." This new universe is the product of an industrial revolution, the like of which man has never before witnessed.

(a) **The industrial revolution.**—This industrial revolution has been due to the use of iron and coal and to the discovery and development of steam and electrical machinery. It has brought into being the modern factory and the vast organization of labor employed in our large industries, the great corporations that direct our economic enterprise, the exceeding large cities making our population half urban, and the means of easy, cheap and rapid intercommunication between almost all parts of the globe. It has increased our wealth enormously and therefore our leisure and our means for scientific research and for study and culture; and it has raised the standard of living of every class in the industrial nations. Not only has it brought close together the individual men of the same nation but it has made nations themselves more and more interdependent. It has opened a vast range of thought and endeavor to better mankind through the abolishing or reducing of poverty, ignorance, disease, crime and war. It has raised the hope and ideal of universal peace, and of the co-operation and federation of all nations.

For more extensive study read:

Byrn, E. W., Progress of Invention in the Nineteenth Century;

Gibbins, H. B., Economic and Industrial Progress of The Century, 1903;
Wallace and others, The Progress of the Century, 1901;
The Nineteenth Century, A Review of Progress (articles reprinted from the "N. Y. Evening Post").

(b) **Democracy.**—A new conception of democracy has arisen supplanting that of the eighteenth century. The "people" has come to mean every member of the nation; and the franchise has been extended until in some commonwealths every normal adult has an equal right to be heard and to be represented in the government. Graft and special privilege, the dominating of the interests of special classes and hidden government have been markedly reduced; and government in the interest of all the people has markedly increased not only in political theory but also in actual political practice. Finally, governments have become far more responsive and more quickly responsive to the thought and wishes of the people.

For more extensive study read:
Scherger, G. L., The Evolution of Modern Liberty, 1904;
Rose, T. H., Rise of Democracy, 1897.

(c) **Socialism, the religion of industrial democracy.**—The word socialism may be used in a broad and a narrow sense. In the broad sense, socialism is to-day a large part of the religion of every enlightened member of the democratic nations. As an ideal it implies co-operation, social service, social efficiency, the universal sharing in the wealth, culture and progress of the nations by the members of the nation; it implies the bettering of all mankind individually and the merciful care of the helpless, the sick, the delinquent and the deficient; and it implies the promoting of the spirit of brotherhood and co-operation between all peoples and the eliminating of the ancient preda-

tory spirit of men and of nations, or rather, the redirecting of this predatory spirit so that men will exploit nature instead of exploiting one another.

In the narrow sense, socialism is the name of a familiar social and economic doctrine and policy that would further revolutionize the industrial and political world. This socialistic movement is so thoroughly characteristic of the nineteenth century and of our time and has had among its members so many intellectual men, that its history belongs in the history of recent philosophic thought as truly as does the doctrine of evolution.

As defined by Bonar,[1] "Socialism is that policy or theory which aims at securing by the action of the central democratic authority a better distribution, and, in due subordination thereunto, a better production of wealth than now prevails." "Modern socialism is (*a*) opposed to the policy of *laissez faire*, which aims at the least possible interference with industrial competition between private persons or groups of persons, and (*b*) suspicious of a policy of mere regulation, which aims at close surveillance and control of the proceedings of industrial competitors, but would avoid direct initiative in production and direct attempts to level the inequalities of wealth. The leading idea of the socialist is to convert into general benefit what is now the gain of a few. He shares this idea with the anarchist, the positivist, the co-operator and other reformers; but, unlike them, to secure this end he would employ the compulsory powers of the sovereign state, or the powers of the municipality delegated by the sovereign."

Socialism as a movement in this narrow sense, goes back to certain utopian thinkers of the first half and middle of the nineteenth century in France and England. As a more scientific theory and policy it goes back to thinkers in Germany, influenced by Hegel's doctrine of

[1] Bonar, J., art. Socialism, Encycl. Brit., 11th ed.

the development of society, of whom Karl Marx (*fl. c.* 1860) was the most prominent and influential. In recent decades it has become distinctly more scientific in that it is based upon an earnest study of economic science and economic, social and political facts. Yet as distinct from economic and political science, it still retains a marked rationalistic character and a spirit that may be called religious rather than scientific. As a movement its political influence in our time, especially in Europe, is powerful; and as a political party the number of its members has grown steadily until to-day it forms in a few European countries a genuine rival of other parties. Another aspect of great importance is its tendency to be an international movement with aims and policies opposed to the prevailing nationalism of our time.

For further study read:

Bonar, art. Socialism, Encycl. Brit., 11th ed.;
MacDonald, J. M., The Socialist Movement (Home University Library);
Dewey and Tufts, Ethics, Part III.

For more extensive study read:

Kirkup, T., History of Socialism (new ed. by Pease), 1913;
Patten, S., The New Basis of Civilization, 1907.

(d) **The new social and anthropological sciences.**—As is to be expected in such an age as the present time has just been described to be, there has been during the past fifty years a great interest in and a vast development of those sciences that directly study man, society, health, education and wealth. This is to be seen, not merely in the growth and spread of research in the fields of ethnology, psychology, medicine, sanitation, education, economics, social and political science, and history, but also in the change within the traditional curricula of our colleges and universities giving a large place to these studies which

formerly were all but unrepresented, and in the increasingly large number of students nowadays attracted to these subjects of study where but a few decades ago they were exceeding few. For example, it is hardly an exaggeration to say that fifty per cent of American students and men of research are engaged as specialists in these fields of study.

For more extensive study read:

Ingram, J. K., History of Political Economy, 2d. ed., 1907;
Small, A. W., The Meaning of Social Science, 1910;
Haddon, History of Anthropology;
Robinson, J. H., The New History, chapter III.

(e) **The readjustment of education to the new knowledge and to the new needs.**—Two great transformations of the schools have taken place during the past fifty years especially, and these changes are not only related to the aforementioned change in our social world but are indicative of a vast philosophical or intellectual change. First, the schools have tended more and more to pass from the control and management of the church into the hands of the government and the public. Education has been more and more secularized. Second, the courses of study and the methods of instruction have changed radically. The educational ideal of the "liberal arts" and the "classics" and the confidence in abstract reasoning as a means of "training the mind" have in spite of opposition and tradition given place to a new conception of education and to a new educational policy. Whatever may be the dangers involved therein, education is becoming more and more utilitarian, more and more an attempt to train the child for the actual life before him and more and more an endeavor to take the child's actual inborn and acquired mental nature into consideration in the devising of methods and the selecting of the subjects of study.

For more extensive study read:
Thorndike, E. L., Education, 1912;
Dewey, J. and E., The Schools of To-morrow, 1915;
Flexner, A., The American College, 1908.

(f) **The freeing of thought.**—Finally, the process of democratizing society is to be seen in the further freeing of religious belief and scientific theory. It is becoming nearer and nearer to being true that a man may adopt any religious creed in which he honestly believes, that church and state are separating as two distinct social organizations, that religious faith carries therewith no legal disability, that the many religious denominations permit among their members greater latitude for honest individual differences of belief, and that men are truly and completely tolerant toward their fellowmen who hold other faiths. Again, it is becoming nearer and nearer to being true that the man of science may freely investigate, draw conclusions and publish the results of his research. Men are learning that theories are to be judged not as matters of personal or arbitrary choice, but as matters depending for their right to be upon facts, that theories are to be judged by fact, not by emotion or by tradition, and that truth even though unwelcome and destructive of old and sacred tradition is far better than error and far safer than ignorance. However far from complete philosophical freedom we may be, we are much nearer to such freedom than the modern world has ever been before; and we are decidedly less fearful than were our ancestors of the consequences of such freedom. We are tending more and more to believe that man's inborn nature and intellectual capacities can be trusted in the long run to lead him surely to seek, to find and to revere the good, the true and the beautiful. If this belief is sound, there is far greater danger in the spirit of conservatism than in the spirit of radical-

ism. Though the conservative may preserve the good there is, the radical alone can add to the good and eliminate the evil. The radical makes many mistakes and must be permitted to do so in the interest of progress, for he is the indispensable condition of progress. The better faith and the better knowledge cannot be got without risk and without price and without mistakes. They can be found only by men whose method of search is the trial and error method, the method to which all other methods of discovery and learning can be reduced.

For further study read:

Robinson, J. H., The New History, chapter VIII.

For more extensive study read:

Bury, History of the Freedom of Thought (Home University Library);
Dickinson, G. L., Justice and Liberty, 1909;
Mill, J. S., Liberty;
Morley, J., On Compromise;
Scherger, G. L., The Evolution of Modern Liberty, 1904.

CHAPTER XXVIII

CONCLUSION

1. The complexity of our present intellectual life.—A detailed account of present philosophical tendencies would make quite evident the extreme complexity of our intellectual life; but even the highly general account just given must impress the thoughtful reader with this complexity. If we take a cross-section of the population of any western land and examine the intellectual life from the lowliest peasant to the master of science, we behold philosophical strata varying from the crude beliefs of prehistoric and prescientific man to the most enlightened beliefs man has ever possessed. If within the highest intellectual classes we take another cross-section, as it were at right angles to the former cross-section, we shall see again an equally complex array of philosophic belief varying from the extreme naturalism of one man to the extreme romanticism of another, from the extreme rationalism of some to the extreme empiricism and positivism of others, and from the extreme subjectivism of a few to the extreme objectivism of another small group.

2. The central tendency man of to-day and the central tendency man of the intellectual class.—However, the averages or central tendencies of these classes are the data which especially interest the historian. How does the central tendency man differ to-day from the central tendency man of other ages? Doubtless, he is more naturalistic, less superstitious, less emotional and hysterical, and more intellectual. But we do well not to estimate the

difference to be so great as to place him far above the central tendency man of other ages. He has indeed tools, methods and customs that make him far more efficient; but it is a mistake to infer that these instruments of culture are thoroughly understood and have made a great difference philosophically. What is rather true is *that the intellectual classes are absolutely far larger and relatively somewhat larger than they have ever been before in human history*. Again, the central tendencies of the intellectual classes are matters of great importance. Who these central tendency intellectual men are, is of course difficult to prove; but I believe that the average college student or alumnus is as high as these central tendency men. Any one well acquainted with the average college man knows only too well how easy it is to overestimate his philosophical stature; but it is easy also to underestimate this stature. He is not a Plato or an Aristotle, but he has absorbed an immense amount of modern philosophy. He has a superior cosmology; he has absorbed the chief lessons of modern naturalism though he is far from being a consistent naturalist; he is vaguely an evolutionist, an empiricist, pragmatist, and experimentalist; he is not above the Greeks as a Cartesian dualist though he is more of a subjectivist; and he is markedly a sentimentalist and a romanticist. If we take the much smaller group, the intellectual class in the narrowest sense, and seek its central tendencies, we shall find, if I mistake not, a decided naturalism, empiricism, pragmatism, experimentalism and Cartesian dualism, but also a growing tolerance and interest in romanticism. Eucken, James, and Bergson are receiving a different hearing to-day from what they would have got from the same class in the eighteenth century.

3. The near future of present philosophical tendencies. —It does not seem venturesome to predict that the great philosophical movement of the twentieth century will be

an endeavor to combine and harmonize intellectualism and romanticism. Nor does it seem venturesome to predict that the issue between religion and naturalism will be solved by the average twentieth century thinker through romanticism added to naturalism, or through some method of harmonizing the two. Regarding rationalism and subjectivism it is more venturesome to predict. Pragmatism and experimentalism are certainly growing tendencies of our intellectual life; and as long as the intellectual world about us is rapidly growing in information they seem liable to remain powerful tendencies. However, should there be a slowing down of the rate of successful scientific research or should the very increase of information force upon us the systematizing and organizing of our vast information, then rationalism will no doubt become again a powerful tendency. If I mistake not, we see such a tendency in mathematics to-day. Regarding subjectivism my own conviction is that Cartesian dualism and the subjectivisms that are its outgrowth are becoming a greater and greater embarrassment both to science in general and to psychology in particular. If this is true, the twentieth century may solve a philosophical problem that has embarrassed science since the days of Democritus.

4. The individual and the group mind.—The great lesson that general history and the history of philosophy are to-day teaching is that culture is the product of both the individual and the group mind. We inherit from the group our philosophy as we inherit our laws or our social conventions and only gradually does the exceptional individual emancipate himself from the dogmatic blindness of the mob. But even this power to emancipate himself must come from his environment. It must come from great economic and social changes, from great discoveries of new truths, or from an environment that encourages individualism and individual variation. Whether or not

the true spirit of freedom and respect for individualism will continue to increase, is more difficult to judge. Perhaps our modern democratic tendencies conceal a great danger, the mob mind and its mediocrity. Will democracy be wise enough to value the true freedom of the exceptional individual, the freedom of the great thinker? Can she be taught what she owes to these men in past generations? Can she learn who gave her the civilization she possesses?

However, the group mind has also its virtue. The individual is liable to be one-sided, the group is many-sided. Life is extremely complex and its complex problems require complex solutions. The tendency of the individual is to oversimplify these problems and to offer simple and unworkable solutions. Tradition and instinct are therefore often wiser than man's intellect. Thus whatever be the philosophy of the decades to come it should be many-sided and complex; and no doubt the group will insist upon this condition with or against the individual thinker.

5. The two aspects of man's intellectual progress.— History as the story of the progress of man has two aspects. First, progress is the reorganization of man's instinctive nature so that it is better adjusted to the environment taken as a constant. Second, progress is the remodelling of man's environment so that it enables man to satisfy better his total inborn nature taken in turn as a constant. Intellectual progress as a human enterprise has two similar aspects. First, intellectual progress is the thinking through what we already know so that we know it better, more consistently and more profoundly. Second, intellectual progress is an ever increasing body of information that is undoing the thought of the older generations and calling for new explanations and new philosophical foundations. Our modern pragmatism has taught us not to

expect finality, and nothing in the spirit of our age or in its complex philosophical thought suggests that a final philosophy is near at hand. Rather our spirit of adventure and our experimentalism make us pleased to believe that the goal of history is still far, far away.

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